B.Tech.(VII Sem.)(R14) (Suppl.)   A.Y. 2019-20

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
B.Tech. (VII Semester) (R14) Supplementary Examinations, October 2020
TIME TABLE

TIME : 10.00 AM to 01.00 PM

DATE	ASE	CE	CSE	ECE	EEE	EIE	IT	ME
12-10-2020 (Monday)	S405-Theory of Vibrations	S244-Estimation and Quantity Surveying	S177-Data Mining and Data Warehousing	S314-Microwave Engineering	S346-Power System Operation and Control	S313-Microprocessors and Microcontrollers	S175-Cryptography and Network Security	S250-Finite Element Method
13-10-2020 (Tuesday)	S154-CAD/CAM S289 - Linear Control Systems	S348-Prestressed Concrete Structures	S316-Mobile Computing	S330-Optical Communications	S385-Solid State Drives	S419-VLSI Design	S157-Cloud Computing	S154-CAD/CAM
14-10-2020 (Wednesday)	S275-Instrumentation, Measurements and Experiments in Fluids	S184-Design of Reinforced Concrete Structures – II	S186-Design Patterns	S155-Cellular and Mobile Communications	S347-Power System Protection	S148-Bio Medical Instrumentation	S186-Design Patterns	S367-Refrigeration and Air Conditioning
15-10-2020 (Thursday)	S281- Introduction to Computational Fluid Dynamics	S172-Construction Management	S153- C# and .NET Programming	S356 - Programmable Logic Devices S318 - Nano Electronics S193- Digital Signal Processors	S218-Electrical Power Quality S379 – Smart Grid S188-Digital Control Systems	S340-PLC and SCADA	S130-Android Application Development	S310-Metrology and Instrumentation
16-10-2020 (Friday)	S358 – Propellant Technology S387 - Space Mechanics	S432-Environmental Pollution Control	S205- E-Commerce	S168-Computer Networks S322 - Neural Networks and Fuzzy Logic	S295-Managerial Economics and Financial Analysis S324-Object Oriented Programming through C++	S344-Power Plant Instrumentation	S382-Software Project Management	S138-Automation in Manufacturing S231-Energy Conservation and Management
17-10-2020 (Saturday)	S329-Operations Research	S369-Remote Sensing and Geographical Information System	S270-Industrial Management	S270-Industrial Management	S270-Industrial Management	S319-Nano Technology S270- Industrial Management	S395-Supply Chain Management	S370-Renewable Energy Sources S357- Project Management

NOTE:
(i) Any omissions or clashes in this time table may please be informed to the Controller of Examinations immediately.
(ii) Even if government/JNTUK/College declares holiday on any of the above dates, the examinations shall be conducted as notified only.
(iii) For any clarification in respect of the above examinations, please contact the Controller of Examinations.

Date: 30-09-2020

Copy to: 1. All Notice Boards 2. All H.O.Ds for N.A.

CONTROLLER OF EXAMINATIONS

PRINCIPAL

| H.T.No | | | | · | | | | | | | | | · | R14 |

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S405-THEORY OF VIBRATIONS
(ASE)

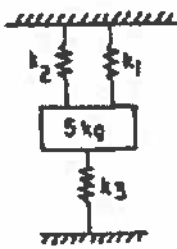Time : 3 hours   Max. Marks : 75
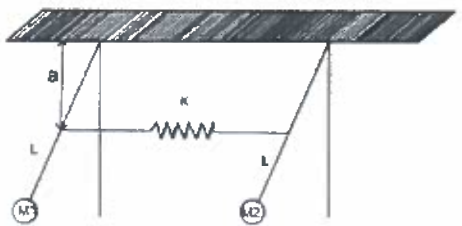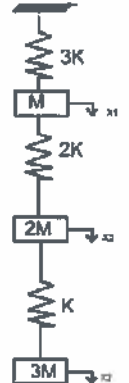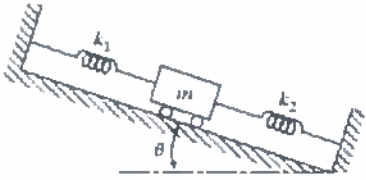
PART-A
(Compulsory question)

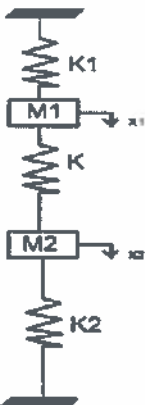| Q.No	Questions	Marks	CO	BL
1(a)	List the various parts of a Vibratory system.	1M	CO1	L1
(b)	Differentiate between underdamped and over-damped system.	1M	CO2	L2
(c)	Define transmissibility and its significance.	1M	CO3	L1
(d)	Define Mode shape.	1M	CO4	L1
(e)	State Maxwell's reciprocal theorem.	1M	CO5	L1
(f)	Distinguish periodic motion and Simple harmonic motion.	2M	CO1	L2
(g)	State the importance of critically damped system with example.	2M	CO2	L1
(h)	What are vibration measuring instruments with example?	2M	CO3	L1
(i)	Define the Semi definite systems.	2M	CO4	L1
(j)	What are generalized co-ordinates?	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	An unknown mass m is attached to one end of a spring of stiffness k having natural frequency of 6 Hz. When 1 kg mass is attached with m the natural frequency of system is lowered by 20%. Derive the value of unknown mass m and stiffness K.	7M	CO1	L6
(b)	Formulate the frequency of the system fig. If $k_1 = k_2 = 1500 N/m$ $K_3 = 2000$ and mass = 5 kg.	8M	CO1	L6
3(a)	Illustrate the expression of displacement equation for damped free vibration.	7M	CO2	L4
(b)	Break down the equation of motion for the system shown in figure when (i) $\varepsilon=1$ (ii) $\varepsilon=.3$ (iii) $\varepsilon= 2$ if the mass is displaced by the distance 3 cm and released.	8M	CO2	L4
4(a)	Formulate the expression when reciprocating and unbalance mass m_0 acting on engines.	7M	CO3	L6
(b)	A single cylinder vertical petrol engine of total mass 320 kg is mounted on steel chassis frame and cause the vertical deflection of .2 cm. the reciprocating part of engine has mass of 24 kg and move through vertical stroke of 15 cm with SHM. A dashpot is provided, the damping resistance of which is directly proportional to the velocity and amounts to 490 N at 3 m/s. Design (i) the speed of driving shaft at which resonance occur (ii) the amplitude of steady state force vibration when driving shaft rotates with 490 rpm.	8M	CO3	L6

5(a)	Consider two pendulum of length L as shown in figure. Break down the natural frequency of each pendulum in generalized form.	8M	CO4	L4
(b)	Analyze the natural frequency of above problem if K =100N/m, m_1 =2 kg, m_2 =5kg, L = 0.20 m , a = 0.1 m.	7M	CO4	L4
6(a)	Predict the value of influence coefficient for the system as shown in figure.	8M	CO5	L3
(b)	Illustrate Orthogonality principle and its application.	7M	CO5	L4
7(a)	Formulate the natural frequency of spring mass system as shown in figure.	7M	CO1	L6
(b)	A vibratory system in a vehicle is to be designed with the following parameters M= 3 kg, k=100N/m, C=3 Nsec/m Determine (i) The damping ratio, (ii) the natural frequency of damped vibration, (iii) logarithmic decrement (iv) ratio of two consecutive amplitude.	8M	CO2	L3
8(a)	Compare between transmissibility and vibration isolation.	7M	CO3	L5
(b)	Assess the frequency of the system in figure. k_1=k_2= 40 KN/m k=60KN/m and m_1=m_2 =10 kg	8M	CO4	L5

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13 OCT 2020 **R14**

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S154-CAD/CAM
(ASE-ME)

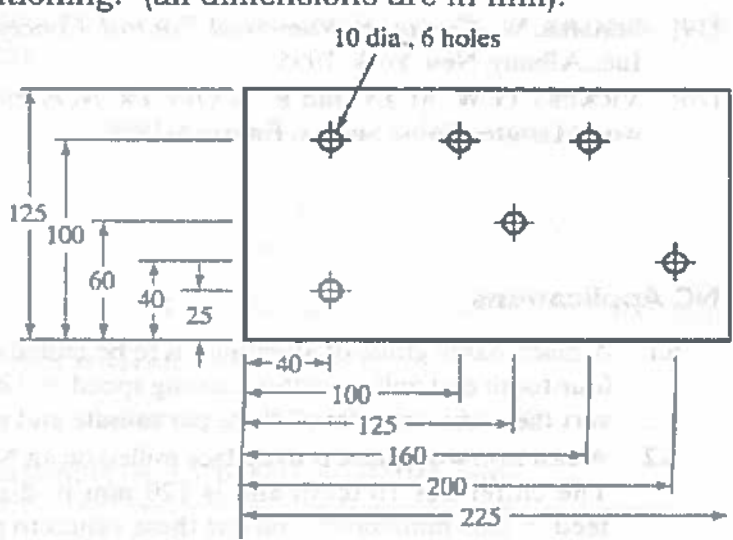Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Give formula for scaling transformation.	1M	CO1	L1
(b)	What is wireframe modeling?	1M	CO2	L1
(c)	Which codes are used for start and stop the spindle rotation in NC program?	1M	CO3	L1
(d)	What are advantages of Group Technology?	1M	CO4	L1
(e)	List out the benefits forCAQC is integrated with CAD/CAM.	1M	CO5	L2
(f)	State the applications of Computer Graphics.	2M	CO1	L1
(g)	What are the solid modeling entities?	2M	CO2	L2
(h)	What are the motion group codes using in CNC program?	2M	CO3	L2
(i)	What are the part classifications of coding?	2M	CO4	L2
(j)	Mention any two limitations of CIM.	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Define the term CAD and differentiate it from conventional design process.	7M	CO1	L4
(b)	A triangle is defined in a two dimensional coordinate system by its vertices (0, 2), (0, 3) and (1, 2). Construct the following transformations on this triangle: (i) Rotate the triangle by 45^0 about the origin (ii) translate the original triangle 2 units in X-direction and 3-units in Y direction.	8M	CO1	L4
3(a)	Illustrate Constructive Solid Geometry method in solid modelling with an example.	7M	CO2	L2
(b)	Classify different analytic surfaces and represent them in parametric way.	8M	CO2	L4
4(a)	What is canned cycle? Explain with suitable example.	7M	CO3	L2
(b)	What is numerical control? Illustrate various elements of NC with a neat diagram.	8M	CO3	L2
5(a)	Define FMS and explain with a neat sketch analyse various components of an FMS.	7M	CO4	L4
(b)	What is meant by CAPP? Examine its benefits and applications over conventional process planning.	8M	CO4	L3

6(a)	Discuss the principles of lean manufacturing.	7M	CO5	L3
(b)	What is a CMM? Classify various types of CMM with neat sketches.	8M	CO5	L4
7(a)	Explain the OPTIZ coding system with example.	7M	CO4	L3
(b)	What is a B-Spline curve? Classify the properties of B-Spline Curve.	8M	CO2	L2
8(a)	What is machine vision? Explain how it can be used for CAQC.	7M	CO5	L2
(b)	Write the part program to drill the holes in the part shown in Figure. The part is 12.0mm thick. Cutting speed = 100mm / min and feed = 0.06 mm / rev. Use the lower left corner of the part as the origin in the x-y axis system. Write the manual part program. Use absolute positioning. (all dimensions are in mm).	8M	CO3	L5

10 dia., 6 holes

125
100
60
40
25
40
100
125
160
200
225

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B.Tech. (VI Semester) ~~Regular~~/Supplementary Examinations

S317-MODERN MACHINING PROCESSES
(ME)

Time : 3 hours

Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	What are the parts of Abrasive Jet Machining (AJM)?	1M	CO1	L2
(b)	List the chemical machining applications.	1M	CO2	L3
(c)	Identify the LASER applications in manufacturing sector.	1M	CO3	L3
(d)	Define Rapid Prototyping.	1M	CO4	L1
(e)	Mention the EOS's process materials.	1M	CO5	L1
(f)	What is the function of Abrasive slurry in Ultra Sonic Machining (USM) process?	2M	CO1	L1
(g)	Identify the various EDM electrode materials.	2M	CO2	L2
(h)	Identify the hot machining process applications.	2M	CO3	L3
(i)	Classify the Powder based Rapid Prototyping (RP) systems.	2M	CO4	L2
(j)	Distinguish Rapid Prototyping Vs Reverse Engineering.	2M	CO5	L3
PART-B				
(Answer any FOUR questions. All questions carry equal marks)				
2(a)	Describe the basic principle of Ultra Sonic Machining process with a suitable sketch and give the applications.	7M	CO1	L1
(b)	Classify the advanced manufacturing processes with examples.	8M	CO1	L2
3(a)	Describe the ECM process and mention the specific applications.	7M	CO2	L1
(b)	Explicate the Wire Cut EDM process with a neat sketch.	8M	CO2	L2
4(a)	Elucidate the Plasma Arc Machining (PAM) process with a neat sketch.	7M	CO3	L2
(b)	Discuss the Laser Beam Machining (LBM) process and mention their advantages and disadvantages.	8M	CO3	L1
5(a)	Estimate the Rapid Prototyping (RP) process chain with draw a neat sketch.	7M	CO4	L2
(b)	Identify the Rapid Prototyping applications in briefly.	8M	CO4	L3
6.	Exemplify the Solid Ground Curing (SGC) process with sequential steps and also mention the advantages and disadvantages.	15M	CO5	L2
7(a)	Describe the working principle of WJM process with a neat sketch and discuss important components in detail.	7M	CO1	L1
(b)	Infer the working principle of Ultra Sonic Machining (USM) Process.	8M	CO1	L2
8.	Illustrate and explicate the Selective Laser Sintering (SLS) process and also write the advantages and disadvantages.	15M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S289-LINEAR CONTROL SYSTEMS
(AE)

Time : 3 hours

Max. Marks : 75

PART-A
(Compulsory question)

1(a) Define transfer function. [1M]

(b) Find the order of the given system.
$$G(s)H(s) = \frac{2(s + 0.1)}{s(s + 0.5)(s + 3)}$$
[1M]

(c) Outline decade frequency. [1M]

(d) List any two conditions for a system to be stable. [1M]

(e) What is meant by controllability? [1M]

(f) List any two rules for block diagram reduction technique. [2M]

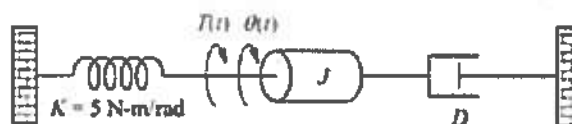(g) Find the damping ratio and natural frequency for the given system.
$$1 + G(s)H(s) = \frac{25}{s^2 + 4s + 25}$$
[2M]

(h) Draw the bode plot for G(s)H(s)=k. [2M]

(i) What are the effects of PI controller on the system performance? [2M]

(j) List any two advantages of state variable analysis. [2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a) Write the differential equations governing the mechanical rotational system shows in figure Determine the transfer function θ (s)/T(s).

[7M]

(b) Discuss about the classification of control systems. [8M]

3. The open lop transfer function of a unity feedback control system is given by
$$G(s) = \frac{K}{s(1 + sT)}$$
By what factor the amplifier gain K should be reduced so that peak overshoot of unit step response is reduced from 75% to 25%. [15M]

4. For a unity feedback system, Sketch the bode-plot and hence comment on the stability.
$$G(s) = \frac{80(0.5s + 20)}{s^2(s + 15)(s + 1)}$$
[15M]

5(a) Determine the range of K for stability of unity feedback system whose open loop transfer function is.

$$G(s) = \frac{K}{s(s+0.1)(s+0.3)}.$$ [7M]

(b) By means of the Routh-Hurwitz criterion, determine the stability of the system represented by the characteristic equation:
$S^5 + S^4 + 24S^3 + 48S^2 - 25S - 5 = 0.$ [8M]

6(a) Given the system
$x(t) = Ax(t) + Bu(t), \quad y(t) = Cx(t)$
Where $A = \begin{bmatrix} 0 & 10 \\ -2.1 & -3.5 \end{bmatrix}$ $B = \begin{bmatrix} 1.2 \\ 5.2 \end{bmatrix}$ $C = [1\ 1]$
Determine the state and output controllability. [8M]

(b) Explain the properties of state transition matrix. [7M]

7(a) Define the following:
  i) Resonant frequency
  ii) Resonant peak
  iii) Phase margin and
  iv) Gain margin. [8M]

(b) Derive output response of second order system for underdamped case and when the input is unit step. [7M]

8. Obtain controllable canonical form, observable canonical form and diagonal form state models for the system whose transfer function is given below.

$$\frac{C(s)}{U(s)} = \frac{0.3s^3 + 2.44s + 4.4}{s^3 + 1.3s^2 + 48}$$ [15M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S275-INSTRUMENTATION, MEASUREMENTS AND EXPERIMENTS IN FLUIDS
(ASE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	What types of forces are dominant in high speed wind tunnels?	1M	CO1	L1
(b)	Write the expression for Froude number.	1M	CO2	L1
(c)	Mention the types of anemometers.	1M	CO3	L1
(d)	Mention the most sensitive temperature measuring device.	1M	CO3	L1
(e)	Explain about data processing.	1M	CO4	L2
(f)	Define pressure drop coefficient.	2M	CO1	L2
(g)	What is the use of knife edge in schlieren graph?	2M	CO2	L1
(h)	Define strouhal number.	2M	CO3	L2
(i)	Discuss aboutprandtl number.	2M	CO3	L2
(j)	Describe about signal conditioning in data acquisition.	2M	CO4	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2.	Enumerate the working of wind tunnel balance and examine the wire type balance.	15M	CO1	L4
3.	Highlight the importance of optical methodsin flow visualization and classify the methods.	15M	CO2	L4
4(a)	Illustrate the working of fluid jet anemometer.	7M	CO3	L3
(b)	Highlight the advantages of Laser Doppler anemometer.	8M	CO3	L4
5(a)	Analyze the measurement of temperature by using thermister with RTD and thermo couple.	7M	CO3	L4
(b)	Defend why reference temperature is necessary while using thermocouple.	8M	CO3	L3
6(a)	Examine the importance of calculating external estimation errors.	7M	CO4	L3
(b)	Derive the expression for uncertainty estimation.	8M	CO4	L3
7(a)	Differentiate low speed wind tunnels and high speed wind tunnels.	8M	CO1	L4
(b)	Inference the potential lines concept in electrolytic tank.	7M	CO2	L4
8(a)	Outline the working of pressure transducers with suitable sketch.	7M	CO3	L4
(b)	Examine the working of pyramid type wind tunnel balance.	8M	CO1	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S281-INTRODUCTION TO COMPUTATIONAL FLUID DYNAMICS
(ASE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	List any two discretization techniques used in CFD.	1M	CO1	L1
(b)	Write the expression for substantial derivative $\left(\dfrac{D}{Dt}\right)$	1M	CO2	L2
(c)	If all the nodes of a grid have same element connectivity then it is called unstructured mesh. [True or False]	1M	CO3	L2
(d)	Upwinding schemes and Staggered grid are suitable for the solution of Incompressible Equations [True or False].	1M	CO4	L1
(e)	Write the 2D Unsteady state heat conduction equation with heat generation.	1M	CO5	L2
(f)	Describe "Divergence of velocity" with expression.	2M	CO1	L2
(g)	Differentiate "Dirichlet boundary conditions" and "Neumann boundary conditions".	2M	CO2	L1
(h)	Write the central difference representation for the second order derivative, $\dfrac{\partial^2 u}{\partial x^2}$	2M	CO3	L1
(i)	What is SIMPLE algorithm?	2M	CO4	L2
(j)	Write the difference equation for 1D heat conduction in Froward in time, Central in space.	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Illustrate with an example that the Computational Fluid Dynamics is useful as a design tool.	7M	CO1	L2
(b)	Distinguish the significances of conservative and non-conservative form of equations used in CFD.	8M	CO1	L2
3(a)	Consider Laplace 's Equation given by $$\frac{\partial^2 \phi}{\partial x^2}+\frac{\partial^2 \phi}{\partial y^2}=0$$ Prove this is an elliptic equation.	7M	CO2	L4
(b)	Describe the mathematical behavior of a hyperbolic equations and describe how it can be solved using CFD with an example.	8M	CO2	L4
4(a)	Derive a forward difference representation for $\dfrac{\partial u}{\partial x}$ Using Taylor's series expansion.	7M	CO3	L3

(b)	Derive the difference equation for a one-dimensional Heat conduction equation, $\frac{\partial T}{\partial t} = \alpha \frac{\partial^2 T}{\partial x^2}$ (where α is thermal diffusivity) with one-dimensional grid representation.	8M	CO3	L3
5(a)	Justify that the central difference scheme is not appropriate for Incompressible Navier-Stokes Equations.	7M	CO4	L2
(b)	Describe staggered grid and summarize its importance.	8M	CO4	L2
6.	Derive the 2D steady-state heat conduction equation in finite difference form for a rectangular body in Explicit and Implicit forms.	15M	CO5	L3
7(a)	Write the steps involved in CFD to solve a fluid dynamic problem.	7M	CO1	L2
(b)	Write the procedure for Eigen Value Method to classify the given PDE.	8M	CO2	L3
8(a)	Write the steps involved in Crank-Nicolson Implicit method to solve a fluid dynamic problem with one example.	7M	CO3	L3
(b)	Prove that 1-D heat conduction equation $\frac{\partial T}{\partial t} = \alpha \frac{\partial^2 T}{\partial x^2}$ is a Parabolic equation where α is thermal diffusivity.	8M	CO2	L4

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S387-SPACE MECHANICS
(AE)

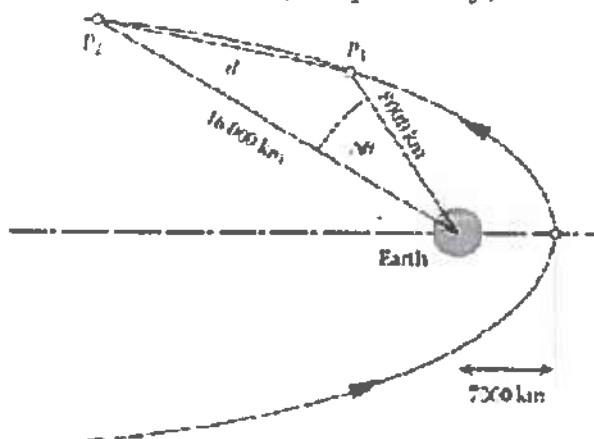Time : 3 hours   Max. Marks:75

PART-A
(Compulsory question)

1(a) Define meteoroids.   [1M]
 (b) Define sphere of influence.   [1M]
 (c) List out the basic types of Ascent trajectories for satellite launch
      vehicles.   [1M]
 (d) Define wait time, t_{wait}.   [1M]
 (e) Define ballistic trajectory.   [1M]
 (f) Write the definitions of Earth's equator and meridians.   [2M]
 (g) State the classical problem in celestial mechanics.   [2M]
 (h) Discuss about perturbed keplerian orbits.   [2M]
 (i) Sketch all the four types of interplanetary trajectories.   [2M]
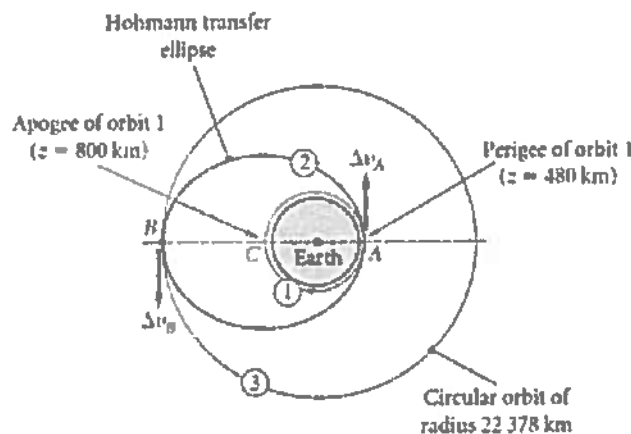 (j) Explain the term 'oblate Earth'.   [2M]

PART-B
(Answer any four questions. All questions carry equal marks)

2(a) The atmosphere of Jupiter is essentially made up of hydrogen, H2. For
      H2, the specific gas constant is 4157 J/(kg)(K). The acceleration of
      gravity of Jupiter is 24.9 m/s2. Assuming an isothermal atmosphere
      with a temperature of 150 K and assuming that Jupiter has a definable
      surface, calculate the altitude above that surface where the pressure is
      one-half the surface pressure.   [7M]
 (b) Define the following parameters to define the position of body related to
      Ecliptic Plane. (i) Ecliptic (ii) Obliquity of Ecliptic (iii) Circles of Celestial
      Longitude (iv) Equinox line.   [8M]

3(a) The perigee of a satellite in a parabolic geocentric trajectory is 7000 km.
      Find the distance d between points P_1 & P_2 on the orbit which are 8000
      km and 16000 km, respectively, from the center of the earth.

                                                                                 [7M]

(b) An unmanned satellite orbits the earth with a perigee radius of 7000 km and an apogee radius of 70000 km. Calculate
(i) The eccentricity of the orbit (ii) The semimajor axis of the orbit
(iii) The period of the orbit (iv) The specific energy of the orbit [8M]

4(a) Determine the expressions how orbital parameters depend on in-plane injection parameters. [8M]

(b) Discuss about important perturbing forces acting on artificial earth satellites. [7M]

5(a) A spacecraft is in a 300km circular earth orbit. Calculate (i) the total delta v required for the Hohmann transfer to a 3000 km coplanar circular earth orbit and (ii) the transfer orbit time. [7M]

(b) A spacecraft is in a 480km by 800km earth orbit (orbit 1) as shown in figure. Find (i) the delta-v required at perigee A to place the spacecraft in a 480km by 16000km transfer orbit (orbit 2); and (ii) the delta-v required at B of the transfer orbit to establish a circular orbit of 16000 km altitude (orbit 3).

[8M]

6(a) Summarize the effect of gravity and micro meteoroids on spacecraft. [7M]
(b) Draw the figure of typical ballistic missile trajectory and discuss its phases. [8M]

7(a) Calculate the standard atmospheric values of T, p, and ρ at a geopotential altitude of 14 km. (T_{14} = 216.66 K). [7M]

(b) Obtain an expression for synodic time T_{syn} in terms of orbital time periods of planet 1 (T_1) and planet 2 (T_2). Using the expression calculate the synodic period of Mars relative to Earth. (T_{Earth} = 365.26 days, T_{Mars} = 687.99 days). [8M]

8(a) Use the equations of motion to show why orbiting astronauts experience weightlessness. [7M]

(b) Estimate the total delta-v requirement for a Hohmann transfer from earth to Mercury, assuming a 150 km circular parking orbit at earth and a 150 km circular capture orbit at Mercury. Furthermore, assume that the planets have coplanar circular orbits with radii equal to the semimajor axes (μ_{sun} = 132.7 × 10⁹ km³/s², μ_{Earth} = 398600km³/s², $\mu_{Mercury}$ = 22930km³/s², R_{Earth} = 149.6 × 10⁶ km, $R_{Mercury}$ = 57.91 × 10⁶ km, r_{Earth} = 6378km, $r_{Mercury}$ = 2440km). [8M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S358-PROPELLANT TECHNOLOGY
(ASE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Define aviation fuel.	1M	CO1	L1
(b)	What is cast modified double base propellant?	1M	CO2	L2
(c)	What is non hypergolic propellants?	1M	CO3	L1
(d)	What will be range of temperatures at which cryogenic propellant stored?	1M	CO4	L2
(e)	What is the use of Bomb Calorimeter?	1M	CO5	L1
(f)	What is an Aviation turbine fuel?	2M	CO1	L1
(g)	Give any two examples of inorganic oxidizers in solid propellants.	2M	CO2	L1
(h)	What is Ignition delay?	2M	CO3	L1
(i)	State any 2 handling problems of cryogenic propellant.	2M	CO4	L2
(j)	Write any 2 applications where thermo gravimetric analysis used.	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	Recall various ingredients present in petroleum and explain the process of making gasoline.	7M	CO1	L2
(b)	Identify various tests to be performed to know the quality of petroleum products.	8M	CO1	L2
3(a)	Catergorize different classes of homogeneous solid propellants. Give examples for each class of propellants.	7M	CO2	L1
(b)	Write a short notes on Composite propellants.	8M	CO2	L1
4(a)	How the liquid propellants are classified? Explain them briefly with suitable examples.	7M	CO3	L1
(b)	Classify various liquid propellant tank configurations with neat sketch.	8M	CO3	L1
5(a)	Identify three areas where the cryogenic technology is widely used in aerospace applications.	7M	CO4	L2
(b)	Evaluate the performance of rockets using cryogenic propellants.	8M	CO4	L1
6(a)	Choose various tests performed to evaluate the performance of propellants and explain about standard burner tests.	7M	CO5	L2
(b)	Evaluate method of particle size analysis and its measurement of propellants.	8M	CO5	L2
7(a)	What is propellant formulation? What are the considerations that govern the formulation of a solid propellant?	7M	CO2	L3
(b)	Classify different propellant grain shapes and configuration.	8M	CO2	L1
8(a)	List various additives used in altering and tailoring propellant properties of liquid propellants.	7M	CO3	L2
(b)	Classify various types of injector configurations with neat sketch.	8M	CO3	L2

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B.Tech. VII Semester Regular/Supplementary Examinations
S329-OPERATIONS RESEARCH

(A E)

Time : 3 hours
Max. Marks : 75

PART-A
(Compulsory question)

1(a)	Define optimum basic feasible solution.	[1M]
(b)	What do you mean by balanced assignment problem?	[1M]
(c)	What is the necessity of maintaining inventory in an industry?	[1M]
(d)	Classify different types of failures in replacement situations.	[1M]
(e)	In which area of an organization can dynamic programming be applied successfully?	[1M]
(f)	Write a short note on graphical method for solving a Linear Programming Problem.	[2M]
(g)	How do you resolve degeneracy in a transportation problem?	[2M]
(h)	Differentiate fair and unfair game.	[2M]
(i)	Describe about Queue size and Queue length.	[2M]
(j)	Illustrate constraint surface.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2. Use penalty (Big-M) method to maximize $Z = 3x_1-x_2$ Subjected to $2x_1+x_2 \geq 2$, $x_1+3x_2 \geq 3$, $x_2 \leq 4$ and $x_1, x_2 \geq 0$. [15M]

3(a) Find the initial solution for a following transportation problem

W-workshop F-Factory	W1	W2	W3	W4	Supply
F1	19	30	50	10	7
F2	70	30	40	60	9
F3	40	8	70	20	18
Demand	5	8	7	14	

[7M]

(b) A department of a company has five employees with five jobs to be performed. The time (in hours) that each man takes to perform each job is given in the effectiveness matrix. Find minimum time of each job to employee.

		Employees				
		I	II	III	IV	V
Jobs	A	10	5	13	15	16
	B	3	9	18	13	6
	C	10	7	2	2	2
	D	7	11	9	7	12
	E	7	9	10	4	12

[8M]

4(a) For the following pay-off matrix, determine the best strategies and the value of the game.

		Player T		
		1	2	3
Player K	1	60	50	40
	2	70	70	40
	3	80	60	75

[7M]

(b) A company has a demand of 12000 units per year for an item and it can produce 2000 such items per month. The cost of one setup is Rs. 400 and the holding cost per unit per month is Rs. 0.15. Find the optimum lot size and the total cost per year, assuming the cost of 1 unit as Rs. 4. Also find the maximum inventory, manufacturing time & total time. [8M]

5. Find the cost per period of individual replacement policy of an installation of 300 light bulbs. Given the following (i)cost of replacing an individual bulb is Rs 2.(ii) conditional probability of failure is given below table no 4.6 .Also calculate the number of light bulbs that would fail during each of the four weeks.

Week No	0	1	2	3	4
conditional probability of failure	0	0.1	0.3	0.7	1.0

[15M]

6. A firm has divided its marking area into three zones. The amount of sales depends upon the number of salesman in each zone. The firm has been collecting the data regarding sales salesman in each area over a number of past year. The information is summarized in table. For the next year firm has only 9 salesmen and the problem is to allocate these salesman to 3 different zones so that the total sales are maximum.

Number of salesman	0	1	2	3	4	5	6	7	8	9
Zone 1	30	45	60	70	79	90	98	105	100	90
Zone 2	35	45	52	64	72	82	93	98	100	100
Zone 3	42	54	60	70	82	95	102	110	110	110

[15M]

7(a) A person wants to decide the constituents of a diet which will fulfill his daily requirements of proteins, carbohydrates at the minimum cost. The choice is to be made from four different types of foods. The yields per unit of these foods are given in the table given.

Food type	Yield per unit			Cost per unit (Rs)
	Proteins	Fats	Carbohydrates	
1	3	2	6	45
2	4	2	4	40
3	8	7	7	85
4	6	5	4	65
Minimum Requirement	800	200	700	

Formulate the linear programming model for the problem. [7M]

(b) Solve the following assignment problem.

Job	Machine				
	A	B	C	D	E
1	11	17	8	16	20
2	9	7	12	6	15
3	13	16	15	12	16
4	21	24	17	28	26
5	14	10	12	11	13

[8M]

8(a) Annual demand for an item is 6000 units. Ordering cost is Rs. 600 per order. Inventory carrying cost is 18 % of the purchase price per unit per year. The price break up is as shown below.

Quantity	Price(Rs)
$0 \leq q1 \leq 2000$	20
$2000 \leq q2 < 4000$	15
$4000 \leq q3$	9

[7M]

(b) A tax consulting firm has 3 counters in its office to receive people who have problems concerning their income, wealth and sales taxes. On average 48 persons arrive in an 8-hour day. Each tax adviser spends 15 minutes on an average on an arrival. If the arrivals are poissonly distributed and service times are according to exponential distribution. Find (i) probability of having no customer in the system, (ii) average number of customers in the system (iii) average number of customers in queue(iv)average time a customer spends in the system. [8M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S244-ESTIMATION AND QUANTITY SURVEYING
(CE)

Time : 3 hours   Max. Marks : 75
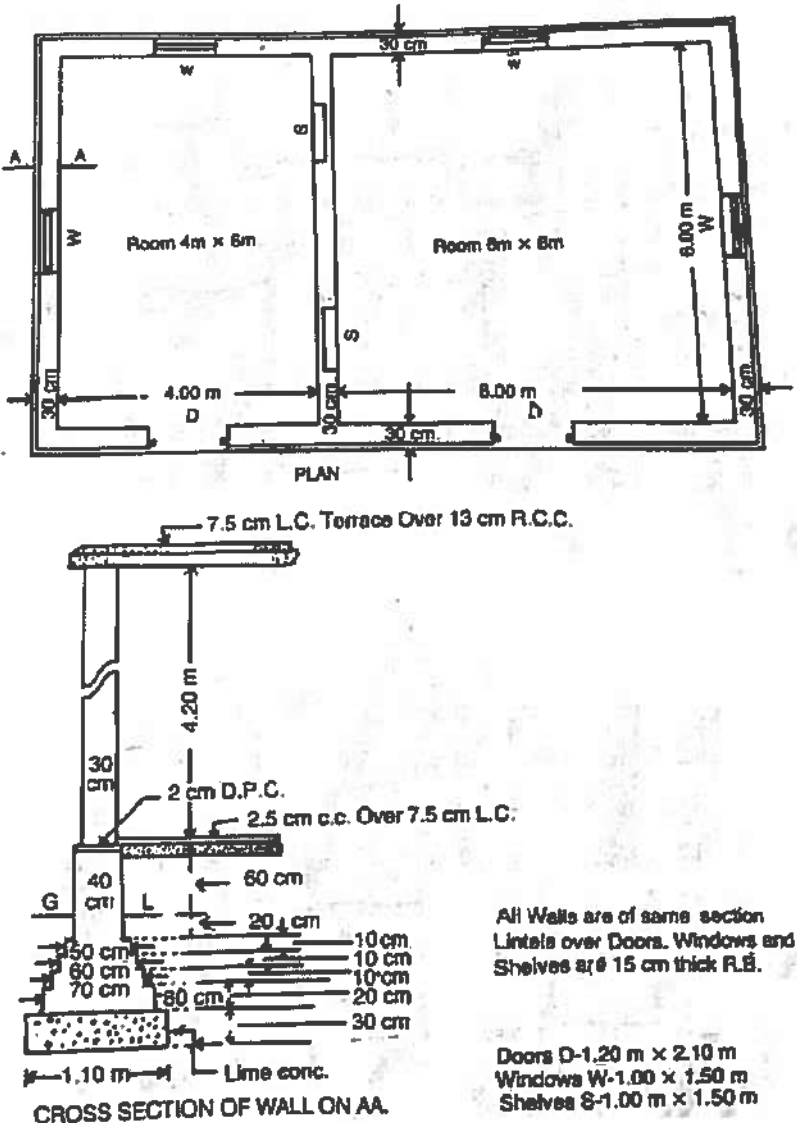
PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	List the methods of estimating quantities.	1M	CO2	L1
(b)	Define lead and lift.	1M	CO3	L1
(c)	Define specification.	1M	CO4	L1
(d)	Describe tender notice.	1M	CO4	L2
(e)	List the different methods of depreciation.	1M	CO5	L1
(f)	Summarize the advantages of centre line method over long wall and short wall method.	2M	CO1	L2
(g)	Explain schedule of bars.	2M	CO3	L2
(h)	Explain Earthen Daula.	2M	CO3	L2
(i)	Explain plinth area estimate.	2M	CO4	L2
(j)	A property fetches a net annual income of Rs.900.00 deducting all outgoings. Calculate the capitalized value of the property if the rate of interest is 6% per annum.	2M	CO5	L3

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Analyze the quantities of earthwork, concrete, brickwork and finishing work of simple step given in the figure.	8M	CO2	L4
(b)	Explain the following main items of work (i) Damp proof course (ii) White washing (iii) Painting.	7M	Co2	L2

3.	Generate a detailed estimate for earthwork for a portion of a road from the following data. Formation width of road is 10m side slope 2:1 in banking and 11/2 : 1 in cutting. Adopt suitable rates.	15M	CO3	L6

Distance in m	0	100	200	300	400	500	600	700	800	900
Ground R.L.	114	114.25	114.75	114.7	115.6	116.35	117.5	117.75	117.6	117.3
RL of formation	115 upward gradient 1 in 200 up to 600m Downward gradient 1 in 400									

4.	Evaluate the quantity of earthwork in an irrigation channel whose L section and type of cross section are given in the figure. The bed width of the channel is 5m & top widths of bank are 3m for the left and 1:50 m for the right bank. Side slopes of excavation is 1:1 and of bank 11/2 : 1. Height of the bank from bed is 2.55m throughout. The longitudinal slope of the bed of the channel is 1 in 5000 Estimate the cost of the earthwork @ Rs. 350.00 per % cum RL of bed at chainage 10 is 98.50	15M	CO3	L5

5(a)	Assess the rate analysis for 2.5 cm cement concrete floor 1:2:4 unit 1 sqm.	7M	CO4	L5
(b)	Assess the rate analysis of R.C.C work in column 1:1.5:3 - unit 1 cum.	8M	CO4	L5

6(a)	Explain briefly (i) Obsolescence (ii) Sinking fund (iii) Year's purchase.	7M	CO5	L2
(b)	Summarize various methods of valuation.	8M	CO5	L2

7(a)	Analyze the quantities of the following items of a two roomed building from the given plan & section by centre line method (i) Earthwork excavation in foundation (ii) Lime concrete in foundation (iii) Damp proof course. PLAN CROSS SECTION OF WALL ON AA.	7M	CO1	L4
(b)	Explain the detailed specifications of Reinforced cement concrete.	8M	CO4	L2

8(a)	Discuss the following (i) Earnest money (ii) Abstract estimate.	7M	CO4	L2
(b)	A three stories building is standing on a plot of land measuring 800 sqm. The plint area of each storey is 400 sqm. The building is of RCC framed structure and the future life taken as 70 years. The building fetches a gross rent of Rs. 1500 per month. Assess the capitalized value of the property on the basis of 6% net yield. For sinking fund 3% compound interest may be assumed. Cost of land taken as Rs. 40 per sqm. Other data required may be assumed suitably.	8M	CO5	L4

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S348-PRESTRESSED CONCRETE STRUCTURES
(CE)

Time : 3 hours

Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Relate the need for the use of high strength concrete and tensile steel in prestressed than conventional concreting.	1M	CO1	L1
(b)	Define bonded and unbonded prestressing concrete.	1M	CO2	L1
(c)	List the IS code provisions in the shear design of PSC members.	1M	CO3	L1
(d)	State any two functions of end block.	1M	CO4	L1
(e)	Summarize the various factors influencing the effective moment of inertia of cracked concrete sections.	1M	CO5	L2
(f)	Differentiate Pre tensioning and Post tensioning systems.	2M	CO1	L2
(g)	List out the losses of prestress.	2M	CO2	L1
(h)	Name the different ways of improving the shear resistance in concrete members.	2M	CO3	L1
(i)	Define the zone of transmission in end block of prestressed concrete structures.	2M	CO4	L1
(j)	Distinguish between short term and long term deflection in PSC members.	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Discuss the advantages and limitations of prestressed concrete.	7M	CO1	L2
(b)	Explain the necessity of using high strength concrete and high tensile steel in prestressed concrete.	8M	CO1	L2
3(a)	A rectangular concrete beam 100 mm wide by 250 mm deep spanning over 8 m is prestressed by a straight cable carrying an effective prestressing force 250 kN located at an eccentricity of 40 mm. The beam supports a live load of 1.2 kN/m. (i) Evaluate the resultant stress distribution for the centre-of-span cross section of the beam assuming the density of concrete as 24 kN/m³ (ii) Find the magnitude of the prestressing force with an eccentricity of 40 mm which can balance the stresses due to dead and live loads at the soffit of the centre span section.	7M	CO2	L3
(b)	Define anchorage slip; Summarize the loss of stress due to anchorage slip.	8M	CO2	L2
4(a)	A pretensioned prestressed concrete beam having a rectangular section 150 mm wide and 350 mm deep, has an effective cover of 50 mm. If f_{ck} is 40 N/mm², f_p is 1600 N/mm² and the area of prestressing steel wire is 461 mm², calculate the ultimate flexural strength of the section using IS :1343 code provisions.	7M	CO3	L3
(b)	A concrete beam of rectangular section has a width of 250 mm and depth of 600 mm .The beam is prestressed by a parabolic cable carrying an effective force of 100 kN. The cable is concentric at supports and has a maximum eccentricity of 100 mm at centre of span. The beam spans over 10 m and supports a uniformly distributed live load of 20 kN/m. Assuming the density of concrete as 24 kN/m³, estimate (i) The maximum principal stress developed in the section of the beam at a distance of 300 mm from the support. (ii) Prestressing force required to nullify the shear force due to dead and live load at the support sections.	8M	CO3	L3

5.	A precast pretensioned beam of rectangular section has a breadth of 100 mm and depth of 200 mm. The beam with effective span of 5 m, is prestressed by tendons with their centroid coinciding with the bottom kern. The initial force in the tendons is 150 kN. The loss of prestress may be assumed to be 15 percent. The beam is incorporated in a composite T-beam by casting a top flange of breadth 400 mm and thickness 40 mm. If the composite beam supports a live load 8 kN/m², calculate the resultant stresses developed in the precast and in situ cast concrete assuming the pretension beam as (i) Un propped and (ii) Propped during the casting of the slab. Assume the same modulus of elasticity for concrete in precast beam and in situ cast slab.	15M	CO4	L3
6(a)	A simply supported beam with a uniform section spanning over 6 m is post-tensioned by two cables, both of which have an eccentricity of 100 mm below the centroid of the section at mid span. The first cables is parabolic and is anchored at an eccentricity of 100 mm above the centroid at each end, the second cable is straight and parallel to the line joining the supports. The cross-sectional are of each cable is 100 mm² and they carry an initial stress of 1200 N/mm². The concrete has a cross-section of 2×10^4 mm² and radius of gyration of 120 mm. The beam supports two concentrated load of 20 kN each at the third points of the span E_c is 38 kN/mm². Calculate using lin's simplified method. The instantaneous deflection at the centre of span	8M	CO5	L3
6(b)	A simply supported beam with a uniform section spanning over 6 m is post-tensioned by two cables, both of which have an eccentricity of 100 mm below the centroid of the section at mid span. The first cables is parabolic and is anchored at an eccentricity of 100 mm above the centroid at each end, the second cable is straight and parallel to the line joining the supports. The cross-sectional are of each cable is 100 mm² and they carry an initial stress of 1200 N/mm². The concrete has a cross-section of 2×10^4 mm² and radius of gyration of 120 mm. The beam supports two concentrated load of 20 kN each at the third points of the span E_c is 38 kN/mm². Calculate using lin's simplified method. The deflection at the centre of span after two years assuming 20 % loss in prestress and effective modulus of elasticity to be 1/3 of the short-term modulus of elasticity.	7M	CO5	L3
7(a)	A pretensioned beam 200 mm wide and 300 mm deep is prestressed by 10 wires of 7 mm diameter initially stressed to 1200 N/mm² with their centroid located 100 mm from the soffit. Find the maximum stress in concrete immediately after transfer, allowing only for elastic shortening of concrete. In the concrete undergoes a further shortening due to creep and shrinkage while there us a relaxation of 5 % of the steel stress, estimate the final percentage of loss of stress in the wires IS : 1343 regulations E_s is 210 kN/mm², E_c is 5700 $(f_{cu})^{1/2}$, f_{cu} is 42 N/mm², creep coefficient 1.6, total residual shrinkage strain 3×10^{-4}	8M	CO2	L3
(b)	A prestressed concrete beam with a rectangular section 120 mm wide by 300 mm deep supports a uniformly distributed load of 4 kN/m, which includes the self weight of the beam. The effective span of the beam is 6 m. The beam is concentrically prestressed by a cable carrying a force of 180 kN. Locate the position of the pressure line in the beam.	7M	CO2	L3
8.	A prestressed concrete beam having a cross-sectional area of 5×10^4 mm² is simply supported over a span of 10 m. If supports uniformly distributed imposed load of 3 kN/m, half of which is non-permanent. The tendon follows a trapezoidal profile with an eccentricity of 100 mm with in the middle- third of span and varies linearly from the third-span points to zero at the supports. The area of tendons 350 mm² has effective prestress of 1290 N/mm² immediately after transfer. Using the following data, Compute (i) Short-term deflections and (ii) Long-term deflections.	15M	CO5	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S184-DESIGN OF REINFORCED CONCRETE STRUCTURES-II
(CE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)
Use the following codes: IS 456-2000 and IS 3370.
Assume any necessary data.

Q.No	Questions	Marks	CO	BL
1(a)	Identify and locate the position of critical section for one-way shear checking in footings.	1M	CO1	L1
(b)	Compare the L/d ratio for circular slab and one way slab.	1M	CO2	L2
(c)	Sketch the going in a staircase.	1M	CO3	L2
(d)	Identify the height of maximum earth pressure in retaining walls.	1M	CO4	L1
(e)	Name the IS code for design of water tanks.	1M	CO5	L1
(f)	Detail the steps to determine the multiplication factor for calculation of permissible bearing stress in an isolated footing.	2M	CO1	L1
(g)	Calculate the effective depth for simply supported circular slab having 5.5m diameter.	2M	CO2	L3
(h)	Calculate number of treads in each flight for a doglegged staircase having R=150 mm, T=250 mm. Take vertical distance between the floors is 3.2m.	2M	CO3	L3
(i)	Outline the concept of overturning effect in retaining walls.	2M	CO4	L4
(j)	Give the factor of safety for underground water tank against floating.	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2.	Design a suitable footing for a column of 500×500 mm, transmitting a load of 1000 kN axially. The column is reinforced with 6 bars of 20 mm diameter. Assume safe bearing capacity of soil is 150 kN/m².	15M	CO1	L5
3.	Design circular slab of diameter 4m which is simply supported at the edges. Adopt service live load as 4kN/m² and M20 grade concrete with Fe415 steel. Assume load factors according to IS456:2000.	15M	CO2	L5
4.	Design a suitable staircase for a residential building of ceiling height 3m. The staircase is situated outside of the structure. Assume suitable data. Use M20 concrete and Fe415 steel. Sketch the reinforcement details.	15M	CO3	L5

5.	Design heel slab and toe slab for the cantilever type retaining wall to retain the earth of 5 m height. Take angle of internal friction 30^0, unit weight of soil is 18 kN/m³ and safe bearing capacity of soil is 200 Kn/m². Use M20 and Fe 415 grades. Draw the reinforcement details.	15M	CO4	L5
6.	Design a circular tank wall to the following requirements Diameter of tank = 6 m, depth of water = 3.75 m, and the tank rests on ground. The wall and the base slab are monolithic use M20 concrete and Fe 415 steel.	15M	CO5	L5
7.	Design side walls for an underground water tank 3m x 8m x 3m for the following data. Submerged sandy soil with density = 16kN/m³ and angle of internal friction = 30^0. The water table can rise up to ground level.	15M	CO5	L5
8.	A flat slab floor system consisting of six panels in each direction supports dead and live load of 7.5 kN/m2 and 6.25 kN/m2 respectively. The supporting columns are of 550 mm X 550 mm with storey height of 3.0 m. Design an interior panel of size 6x 6 m using IS 456 for the direct design method, when no column head or drop is provided. Use M25 concrete and Fe 415 steel.	15M	CO2	L5

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B.Tech. (VII Semester) ~~Regular/~~Supplementary Examinations

S432-ENVIRONMENTAL POLLUTION CONTROL
(CE)

Time : 3 hours Max. Marks : 75

PART-A
(Compulsory question)

Q.No.	Question	Marks	CO	BL
1(a)	Define inversion.	1M	CO1	L1
(b)	What are the limitations of Gravity settling chambers?	1M	CO2	L2
(c)	Differentiate between garbage and rubbish.	1M	CO3	L2
(d)	What is audible frequency range for human ear?	1M	CO4	L1
(e)	When do you call a waste as hazardous waste?	1M	CO5	L1
(f)	Convert 100 µg/m³ of CO at STP into ppm of CO.	2M	CO1	L3
(g)	What are the guide lines for minimum stack height?	2M	CO2	L2
(h)	What are the advantages and limitations of incineration?	2M	CO3	L2
(i)	Write Noise level standards for residential and industrial areas.	2M	CO4	L1
(j)	Define E-waste and give any two examples.	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Explain various types of air pollutants with suitable examples.	7M	CO1	L2
(b)	Discuss various types of plumes that are formed under various meteorological conditions with suitable diagrams.	8M	CO1	L2
3(a)	Draw a neat sketch and describe working principle of an Electrostatic Precipitator.	8M	CO2	L2
(b)	A stack of height 60 m releases 360 mg/sec of Sulphur Dioxide with a velocity of 5 m/s. The stack inner diameter at the exit is 1.5 m. The stack gas temperature is 250°C. Determine the plume rise by applying any two equations. Determine the effective stack height in each case.	7M	CO2	L3
4(a)	Describe general sources and properties of municipal solid waste.	7M	CO3	L2
(b)	Explain sanitary land filling method of solid waste disposal. What are the advantages and disadvantages of sanitary land filling method?	8M	CO3	L2
5(a)	Discuss various sources and effects of noise pollution.	8M	CO4	L2
(b)	Traffic noise levels taken at 20 min. interval for 120 min. are given in the following table. Determine L_{eq}.	7M	CO4	L3
6(a)	Explain various methods of disposal of Bio-medical wastes.	8M	CO5	L2
(b)	Justify the need of Environmental Impact Assessment. What are its limitations?	7M	CO5	L5
7(a)	Explain any two methods of control of gaseous pollutants.	8M	CO2	L2
(b)	Determine the theoretical volume of methane gas that would be expected from the anaerobic digestion of a tonne of a waste having the composition of $C_{50}H_{100}O_{40}N$.	7M	CO3	L3
8(a)	Discuss various methods for the control of noise pollution.	7M	CO4	L2
(b)	Describe the effects any four meteorological parameters on dilution and dispersion of air pollution.	8M	CO1	L2

Table for 5(b):

Time, min	20	40	60	80	100	120
Noise level, dB (A)	70	68	85	75	72	70

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S369-REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM
(CE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Define remote sensing.	1M	CO1	L1
(b)	What is meant by digital image processing?	1M	CO4	L2
(c)	What is vector data?	1M	CO3	L2
(d)	What are the logical operators?	1M	CO3	L3
(e)	Write some of the applications of GIS.	1M	CO5	L2
(f)	Distinguish between active and passive sensors.	2M	CO1	L1
(g)	What is meant by image enhancement?	2M	CO4	L2
(h)	What do you mean by spatial and non spatial data?	2M	CO3	L4
(i)	What is DBMS?	2M	CO3	L3
(j)	What are the remote sensing data requirements for surface water mapping?	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Explain the basic concepts and fundamentals of remote sensing.	8M	CO1	L2
(b)	Explain the different types of sensors.	7M	CO1	L2
3.	Explain about the various elements involved in visual interpretation.	15M	CO2	L1
4(a)	Write the comparison between the vector models and raster model.	8M	CO3	L2
(b)	Discuss in detail about the components of GIS.	7M	CO3	L3
5(a)	Explain the spatial operations with example.	8M	CO3	L4
(b)	Describe the layer based GIS mapping.	7M	CO3	L3
6.	Explain how to interpret land use –land cover from various sources.	15M	CO5	L3
7(a)	What are the GIS layers developed for groundwater potential zoning mapping?	7M	CO5	L3
(b)	What is the methodology that can be adopted for flood forecasting and early warning to the stakeholders using RS and GIS?	8M	CO5	L4
8(a)	Explain the atmospheric windows with neat sketch.	7M	CO1	L4
(b)	Explain in detail energy interaction with the earth surface.	8M	CO1	L1

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B.Tech. (VI Semester) Regular/Supplementary Examinations

S177-DATA MINING AND DATA WAREHOUSING

Time : 3 hours   (CSE)   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	What is the main idea of Concept hierarchy?	1M	CO1	L1
(b)	Outline the strategies for data reduction.	1M	CO2	L1
(c)	Define k-itemset.	1M	CO3	L1
(d)	Define accuracy of a classifier.	1M	CO4	L1
(e)	What is a text database?	1M	CO5	L1
(f)	Why data mining is required?	2M	CO1	L1
(g)	Why do we need data preprocessing?	2M	CO2	L1
(h)	Define support and confidence with an example.	2M	CO3	L1
(i)	Define binary and nominal variables.	2M	CO4	L1
(j)	Define visual data mining and audio data mining.	2M	CO5	L4

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	With a neat sketch, present the architecture for Online Analytical Mining.	7M	CO1	L3
(b)	Classify different data mining functionalities with examples.	8M	CO1	L3
3(a)	List the different data cleaning methods and explain.	7M	CO2	L1
(b)	Illustrate the processes for measuring the central tendency.	8M	CO2	L2
4(a)	Consider the following set of frequent 3-itemsets: {1, 2, 3}, {1, 2, 4}, {1, 2, 5}, {1, 3, 4}, {1, 3, 5}, {2, 3, 4}, {2,3,5}, {3,4, 5}. Assume that there are only five items in the data set. (i) List all candidate 4-itemsets obtained by the candidate generation procedure in Apriori. (ii) List all candidate 4-itemsets obtained by a candidate generation procedure using the $F_{k-1} \times F_1$ merging strategy.	7M	CO3	L4
(b)	Explain Apriori algorithm for frequent itemset generation.	8M	CO3	L2
5(a)	List the techniques to estimate Classifier Accuracy.	7M	CO4	L1
(b)	Compare and contrast K-means clustering Vs Hierarchical clustering.	8M	CO4	L4
6(a)	How can you apply data mining on Financial data?	7M	CO5	L1
(b)	Illustrate the time series and sequence data.	8M	CO5	L2
7.	Consider the following transactional database with min_sup = 60% and min-conf = 80%.	15M	CO3	L3
8(a)	Demonstrate the procedure to generate association rules from frequent item sets with example.	7M	CO3	L2
(b)	What are different schemas for design of a data ware house? Explain with neat sketches.	8M	CO1	L1

For Q.No 7:

TID	List of items
001	M, O, N, K, E, Y
002	D, O, N, K, E, Y
003	M, A, K, E
004	M, U, C, K, Y
005	C, O, O, K, I ,E

(i) Build all frequent item sets using Apriori algorithm.
(ii) Develop strong association rules from frequent item set.

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S316-MOBILE COMPUTING
(CSE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Define Mobile Computing.	1M	CO1	L1
(b)	What is agent in Mobile computing?	1M	CO2	L1
(c)	List out table driven routing protocols in MANETS.	1M	CO2	L1
(d)	What is android?	1M	CO5	L1
(e)	What is VOIP?	1M	CO5	L1
(f)	List out the protocols in GSM.	2M	CO2	L1
(g)	Distinguish between Mobile IP and Traditional TCP.	2M	CO2	L3
(h)	Illustrate any three Characteristics of MANETS.	2M	CO3	L2
(i)	Explain how to set up development environment in Android.	2M	CO5	L2
(j)	Illustrate the features of IOS operating system.	2M	CO4	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	Explain the Novel applications and limitations of Mobile Computing.	7M	CO3	L2
(b)	Discuss about Hidden & Exposed terminals, Near & Far terminals problems with respect to MAC.	8M	CO1	L2
3(a)	Compare and Contrast Snooping TCP and Mobile TCP.	7M	CO2	L3
(b)	Explain in detail about the IP Packet delivery and Handover Management in Mobile Computing.	8M	CO2	L5
4(a)	Compare and Contrast the features of table driven and on demand routing Protocols.	8M	CO3	L3
(b)	Justify how security plays a key role in MANETS.	7M	CO4	L5
5(a)	Explain about the UI components in the Android operating system.	8M	CO5	L2
(b)	Classify different layouts in Android.	7M	CO5	L4
6(a)	Outline the VOIP architecture.	7M	CO4	L2
(b)	Discuss about the various layers in the WAP architecture.	8M	CO4	L6
7(a)	Explain about the GSM System architecture with a neat diagram.	7M	CO2	L2
(b)	Classify TDMA, SDMA and FDMA.	8M	CO1	L4
8(a)	Explain about the applications of MANETS.	7M	CO3	L2
(b)	Justify how selective retransmission is useful in Mobile Computing.	8M	CO2	L5

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S186-DESIGN PATTERNS
(CSE&IT)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	List out the patterns used in design patterns.	1M	CO1	L1
(b)	Give the meaning of "WYSIWYG".	1M	CO2	L2
(c)	Can We Use an Abstract Factory? Justify your answer.	1M	CO3	L5
(d)	What are the two models used in behavioral pattern?	1M	CO4	L1
(e)	What can you do if you are interested in patterns?	1M	CO5	L1
(f)	Demonstrate 4 essential features of design pattern.	2M	CO1	L3
(g)	Define Formatting.	2M	CO2	L1
(h)	Define the motivation of adapter patterns.	2M	CO3	L1
(i)	Write about Chain of Responsibility.	2M	CO4	L6
(j)	State different ways in which our work is like Alexander's.	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	Discuss the MVC architecture in small talk.	8M	CO1	L2
(b)	Explain the step - by - step approach for selecting the design pattern.	7M	CO1	L2
3(a)	Explain how design patterns can solve the design problems of a document editor.	7M	CO2	L3
(b)	Describe in detail about how Multiple Window Systems is supported.	8M	CO2	L1
4(a)	Discuss about structure applicability, participants of abstract factory method.	7M	CO3	L2
(b)	Write and explain the consequences, applicability and implementation issues of a flyweight patterns.	8M	CO3	L3
5.	Discuss about intent, motivation, structure, applicability and consequences of a mediator behavioral pattern.	15M	CO4	L2
6(a)	List and brief the expectations from Design patterns.	8M	CO5	L1
(b)	Write a brief history of design pattern.	7M	CO5	L1
7(a)	Write about (i) documentation and learning aid (ii) Alexander's pattern languages.	8M	CO1	L1
(b)	Discuss the two embellishments that can be added to Lexi's user interface. Signify the role of decorator pattern in embellishment.	7M	CO2	L2
8(a)	Explain the structure of decorator pattern with suitable example.	8M	CO3	L2
(b)	Write the sample code for Template method and Visitor patterns.	7M	CO4	L3

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B.Tech. (VII Semester) Regular/Supplementary Examinations

S153-C# AND .NET PROGRAMMING
(CSE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Define Boxing.	1M	CO1	L1
(b)	Define the following terms (i) Multitasking (ii) Multithreading.	1M	CO2	L1
(c)	List any 4 controls for building windows form application.	1M	CO3	L1
(d)	Describe the role of virtual directory in IIS manager.	1M	CO4	L2
(e)	Define the following terms (i) CLR (ii) MSIL.	1M	CO5	L1
(f)	List some features of C#.	2M	CO1	L1
(g)	Examine the role of a property in a class.	2M	CO2	L2
(h)	Describe the usage of "DataSet" object in ADO.Net.	2M	CO3	L2
(i)	Write the ASP.Net tags for Label and Button controls.	2M	CO4	L1
(j)	What are attributes and why do we need them in .NET framework?	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	Write a C# program to illustrate various methods of Array class.	7M	CO1	L2
(b)	Demonstrate the usage of data types in C#.	8M	CO1	L2
3(a)	Write a C# program to achieve compile time & run time polymorphism in C#.	7M	CO2	L3
(b)	Distinguish between interfaces and abstract class with an example.	8M	CO2	L2
4(a)	Develop a C# application to retrieve table data from SQL Database using console application.	7M	CO3	L3
(b)	Describe ADO.Net steps to communicate with SQL Database with suitable example.	8M	CO3	L2
5(a)	Design ASP.Net web application to validate the login form (Static) with username "CSE" and password "CSE123".	7M	CO4	L3
(b)	Describe the steps to create virtual directory in IIS manager to host ASP.Net web application.	8M	CO4	L2
6(a)	Demonstrate the role of reflection in .NET framework.	7M	CO5	L2
(b)	Examine the classes available in System.Reflection Namespace.	8M	CO5	L2
7(a)	Demonstrate the concept of delegate with an example program.	7M	CO2	L2
(b)	Write a C# program to implement the following forms of inheritance. (i) Single inheritance (ii) Multilevel inheritance.	8M	CO2	L3
8(a)	Write a C# program to print prime numbers between 1 and n.	7M	CO1	L2
(b)	Write C# program to create simple calculator by using windows application.	8M	CO3	L3

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B.Tech. VII Semester Regular/Supplementary Examinations

S270–INDUSTRIAL MANAGEMENT
(CSE , ECE & EEE)

Time: 3 hours   Max. Marks: 75

PART-A
(Compulsory question)

1(a) What is the organization structure most suited for continuous process industry? [1M]
(b) What are the different methods of production? [1M]
(c) State the formula for determining EOQ. [1M]
(d) Define the term "Wage". [1M]
(e) What is meant by "Critical path of a network"? [1M]
(f) State any two principles of Scientific Management. [2M]
(g) What are the steps involved in Method Study? [2M]
(h) Distinguish between variables and attributes with examples. [2M]
(i) State any four functions of HR Manager. [2M]
(j) State the rules for drawing network diagram. [2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a) Explain the principles of Modern Management. [7M]
(b) Explain the Maslow's Need Theory. [8M]

3(a) Discuss the procedure of determining standard time. [7M]
(b) Explain the plant layout suitable for mass production. [8M]

4(a) Explain Deming's contribution to quality. [7M]
(b) Draw control chart for mean X and range R from the following data relating to 20 samples of size 5 each and comment whether it is in statistical quality control or not.

S. No.	$\overline{X}$	R	S. No.	$\overline{X}$	R
1	38	15	11	32	30
2	33	1	12	22	11
3	24	22	13	21	28
4	36	24	14	28	21
5	27	28	15	28	15
6	30	33	16	24	18
7	31	21	17	30	19
8	27	20	18	25	33
9	24	29	19	37	17
10	29	18	20	31	17

For a sample of size 5, $D_3 = 0.000$, $D_4 = 2.115$, $A_2 = 0.577$ [8M]

5(a) Explain the significance of Human Resource Management in enhancing productivity.   [7M]
 (b) Discuss the various methods of Merit rating.   [8M]

6.   The various time estimates of activities involved in a project are given in table.

Activities	1-2	1-3	2-4	2-3	3-4	3-5	4-6	5-6
t_o	2	4	2	2	0	3	6	1
t_m	6	8	3	4	0	6	10	3
t_p	10	12	4	6	0	9	14	5

Determine:
i) The expected completion time of the project.
ii) The variance and standard deviation of the project.
iii) The probability factor of completing the project within 23 days.   [15M]

7(a) Explain the features of Matrix Organization Structure.   [7M]
 (b) Explain the procedure adopted for purchasing of materials.   [8M]

8(a) Explain the procedure of crashing a network.   [7M]
 (b) What the principles of Plant Layout?   [8M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S314-MICROWAVE ENGINEERING
(ECE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	Write the velocity modulation equation.	[1M]
(b)	Define the frequency pulling.	[1M]
(c)	Expand TRAPATT.	[1M]
(d)	Mention the purpose of isolator.	[1M]
(e)	What is the composition used in ferrites?	[1M]
(f)	Draw the structure of Reflex klystron oscillator.	[2M]
(g)	Name any four examples for slow wave structures.	[2M]
(h)	What is the Gunn effect?	[2M]
(i)	If Isolation=40dB, Coupling factor =20dB, determine the value of Directivity in dB.	[2M]
(j)	State the principle used in isolator.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Discuss the limitations of conventional tubes at microwave frequencies.	[7M]
(b)	Describe the Principle of velocity modulation using 2-cavity klystron amplifier.	[8M]
3(a)	Derive the expressions for propagation constants in TWT and explain.	[7M]
(b)	An X-band pulsed cylindrical magnetron has the following parameters: Anode voltage V_0=26kV, Beam current I_0=27A, Magnetic flux density B0=0.336Wb/m^2, Radius of cathode cylinder a=5cm, Radius of vane edge to center b=10cm Compute (i) The cyclotron angular frequency (ii) The cutoff voltage for fixed B_0 (iii) The cutoff Magnetic flux density for fixed V_0.	[8M]
4(a)	Explain the construction of Gunn diode using RWH theory.	[7M]
(b)	What is IMPATT diode and explain the principle of operation?	[8M]
5(a)	Obtain the S-matrix for E-plane Tee.	[7M]
(b)	Draw and explain the operation of 2-hole coupler.	[8M]
6(a)	What is Faraday rotation? Explain how a 4 port circulator operates with the use of 2 Magic tees and one Gyrator.	[7M]
(b)	Explain the working of Isolator based on Faraday rotation.	[8M]
7.	Explain the velocity modulation of a reflex klystron and derive the expression for round trip transit time in the repeller region.	[15M]
8(a)	Compare E-plane Tee and H-plane Tee.	[7M]
(b)	Define the parameters of coupler and also derive the S-matrix of it.	[8M]

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B.Tech. (VII Semester) Regular/Supplementary Examinations
S330-OPTICAL COMMUNICATIONS
(ECE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Recall the acronym for SEA-ME-WE3 cable.	1M	CO1	L1
(b)	Show expression of optical power of 1W in dBm.	1M	CO2	L1
(c)	Restate the examples of ternary and quaternary semiconductor materials.	1M	CO3	L2
(d)	List out the required properties of a photo detector.	1M	CO4	L2
(e)	Relate the Optical Bandwidth in terms of spectral width of the light source.	1M	CO5	L2
(f)	Draw the standard structure of the fiber.	2M	CO1	L2
(g)	Define the terms material and waveguide dispersions.	2M	CO2	L2
(h)	List out the LASER light properties.	2M	CO3	L1
(i)	At 1.3μm, the quantum efficiency of InGaAs photo detector is 0.6. Calculate its responsivity.	2M	CO4	L3
(j)	What are the important factors taking into account for system considerations?	2M	CO5	L2

PART-B
[Answer any FOUR questions. All questions carry equal marks]

Q.No	Questions	Marks	CO	BL
2(a)	A multimode step index fiber with a core diameter of 80μm and a relative index difference of 1.5% is operating at a wavelength of 0.85μm.If the core refractive index is 1.48, estimate (i) The Normalized frequency for the fiber (ii) Number of guided modes.	7M	CO1	L2
(b)	Describe the ray optics representation of skew rays and meridional rays.	8M	CO1	L3
3(a)	Discuss different types of linear scattering losses.	7M	CO2	L2
(b)	When the mean optical power launched into an 8 Km length of fiber is 120μw, the mean optical power at the fiber output is 3 μw. Calculate the overall signal attenuation in decibels and overall signal attenuation for a 10 Km length of same kind of fiber.	8M	CO2	L3
4(a)	A double-hetero junction InGaAsP LED emitting at a peak wavelength of 1310 nm has radiative and non radiative recombination times of 30 and 100 ns, respectively. The drive current is 40 mA. Find (i) The internal power generated in the device and (ii) The power emitted from the device.	7M	CO3	L3
(b)	Relate the internally generated power of an LED with the drive current and derive the same.	8M	CO3	L3
5(a)	Develop the expression for quantum efficiency and responsivity of a photo detector.	7M	CO4	L1
(b)	Draw the reach-through avalanche photodiode structure and explain the operation of it.	8M	CO4	L3
6(a)	Elaborate the concept of SONET/SDH rings.	7M	CO5	L1
(b)	Discuss about link power budget analysis with example.	8M	CO5	L3
7(a)	Discuss the following terms (i) Hetero junction (ii) Types of LED (iii) Lambertian pattern (iv)FWHM	7M	CO3	L1
(b)	Classify and discuss about the types of noises affecting the signal to noise ratio.	8M	CO4	L2
8(a)	Mention the advantages and necessity of Wavelength Division Multiplexing.	7M	CO5	L2
(b)	An optical signal, after propagating through a fiber has lost 80% of its power in a length of 600m of fiber. Calculate the loss in dB/Km of this fiber.	8M	CO2	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S155-CELLULAR AND MOBILE COMMUNICATIONS
(ECE)

Time: 3 hours

Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Show the frequency reuse pattern for N=4.	1M	CO1	L1
(b)	Define the term multipath.	1M	CO2	L1
(c)	Name any two types of non co-channel interference.	1M	CO3	L1
(d)	Interpret the spectrum allocated for AMPS system.	1M	CO4	L2
(e)	List out any two Multiple access techniques.	1M	CO5	L1
(f)	Name the service quality parameters.	2M	CO1	L1
(g)	Identify the factors that influence fading.	2M	CO2	L1
(h)	Mention the use of parasitic elements.	2M	CO3	L3
(i)	Define fixed channel assignment.	2M	CO4	L1
(j)	Describe the term SDMA.	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Describe the performance criterion measured for mobile cellular communication.	7M	CO1	L2
(b)	Summarize the concept of (i) Frequency reuse (ii) Cell splitting.	8M	CO1	L2
3(a)	List the various factors effecting Indoor propagation models.	7M	CO2	L1
(b)	Interpret the 2-Ray model propagation.	8M	CO2	L2
4(a)	Differentiate between the Next Channel Interference and Neighboring Channel Interference.	7M	CO3	L2
(b)	Summarize the Near-End to Far-End Interference in One Cell and in Cells of Two Systems.	8M	CO3	L2
5(a)	Illustrate the handoff strategies.	7M	CO4	L4
(b)	Discuss the Underlay-Overlay Arrangement in cellular systems.	8M	CO4	L2
6(a)	Describe the features of TDMA	7M	CO5	L2
(b)	Determine the frame efficiency of a normal GSM timeslot consists of 6 trailing bits, 8.25 guard bits, 26 training bits and 2 traffic bursts of 61 bits of data.	8M	CO5	L3
7(a)	Summarize the factors influencing small scale fading.	7M	CO2	L2
(b)	Describe the different types of non co-channel interferences.	8M	CO3	L2
8(a)	Identify the control channels with the help of frequency management chart.	7M	CO4	L1
(b)	Discuss the advantages and disadvantages of FDMA.	8M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S356-PROGRAMMABLE LOGIC DEVICES
(ECE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Classify the PLD'S.	1M	CO1	L1
(b)	What are the functional blocks of FPGA?	1M	CO2	L1
(c)	Distinguish between channeled gate array and channel less gate array based ASIC.	1M	CO3	L1
(d)	What is an antifuse? List the different types of antifuse.	1M	CO4	L1
(e)	List the different features of XILINX LCA interconnect architecture.	1M	CO1	L1
(f)	Define the PLD.	2M	CO2	L1
(g)	Define the DRC and LVS.	2M	CO3	L1
(h)	Construct the inverter diagram using CMOS.	2M	CO4	L1
(i)	What are the features of full custom ASIC?	2M	CO1	L1
(j)	What is totem-pole output and draw the circuit?	2M	CO2	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Explain the architecture of 4:1 mux using PLA and PAL.	7M	CO1	L2
(b)	Discuss on CPLD implementation of a parallel adder with accumulation.	8M	CO1	L2
3(a)	Illustrate the architecture of routing architecture of FPGA.	7M	CO2	L3
(b)	Explain about Programmable I/O blocks in FPGAs.	8M	CO2	L2
4(a)	Explain the different types of ASIC.	7M	CO3	L2
(b)	Explain the lambda based design rules, draw the layout of two input NAND gate.	8M	CO3	L2
5(a)	Implement full substractor using PROM. Explain.	7M	CO4	L3
(b)	Explain the metal – metal antifuse with neat diagrams.	8M	CO4	L2
6(a)	Explain the actel ACT architecture.	7M	CO4	L2
(b)	List out the salient features of Xilinx 3000 CLB.	8M	CO4	L1
7(a)	Explain with necessary diagrams the features of xilinx LCA interconnect.	7M	CO1	L2
(b)	List and explain the programmable ASIC I/O cells.	8M	CO1	L1
8(a)	What is datapath element? State the advantage and disadvantage of using datapath elements in VLSI design.	7M	CO2	L1
(b)	Discuss the different components contributing to transistor parasitic capacitance.	8M	CO2	L2

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B.Tech (VII Semester) ~~Regular~~/Supplementary Examinations

S168-COMPUTER NETWORKS
(ECE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Give any two examples for Guided-Transmission media.	1M	CO1	L1
(b)	What is framing?	1M	CO2	L1
(c)	Define flooding.	1M	CO3	L2
(d)	Define multiplexing.	1M	CO4	L2
(e)	What is the advantage of Domain Name System?	1M	CO5	L2
(f)	What is the difference between LAN and WAN?	2M	CO1	L1
(g)	How is the minimum size of an Ethernet frame determined?	2M	CO2	L2
(h)	Define subnetting and give an example.	2M	CO3	L1
(i)	Draw TCP Header format.	2M	CO4	L2
(j)	Why is UDP Pseudo header included in UDP checksum calculation? What is the effect of an invalid checksum at the receiving UDP?	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	With a neat Sketch, explain the function of OSI Network Architecture.	8M	CO1	L1
(b)	Explain the different topologies of the network.	7M	CO1	L1
3(a)	Explain various classes of IEEE 802.X standard Ethernet.	8M	CO2	L2
(b)	Explain Slotted ALOHA.	7M	CO2	L2
4(a)	What is the problem of Go-Back-N Protocol? How it can be solved?	7M	CO2	L2
(b)	Draw and explain HDLC frame format.	8M	CO2	L2
5(a)	Explain distance vector routing algorithm in detail.	8M	CO3	L3
(b)	Explain the RIP Algorithm with a sample example of your choice.	7M	CO3	L3
6(a)	Explain multicasting routing protocol Distance Vector Multicast Routing Protocol with example.	8M	CO4	L3
(b)	Discuss about Address Resolution Protocol.	7M	CO4	L3
7(a)	Explain the structure of TCP Header format.	7M	CO4	L4
(b)	Explain flow control in transport layer in detail.	8M	CO4	L4
8(a)	Explain about Domain Name System.	7M	CO5	L2
(b)	List and Explain the two fundamental cryptographic principles.	8M	CO5	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S346-POWER SYSTEM OPERATION AND CONTROL
(EEE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Draw the heat rate curve of steam unit.	1M	CO1	L1
(b)	Define unit commitment.	1M	CO1	L1
(c)	What is load frequency control?	1M	CO2	L1
(d)	Define load compensation.	1M	CO2	L2
(e)	Define Deregulation.	1M	CO4	L1
(f)	Write the general second degree polynomial of cost function.	2M	CO1	L2
(g)	List the methods used to solve the unit commitment problem.	2M	CO1	L2
(h)	Draw the frequency deviation response of an isolated power system with and without PI controller.	2M	CO2	L2
(i)	What are the sources of reactive power?	2M	CO3	L2
(j)	List the benefits associated with deregulation.	2M	CO4	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	Derive the condition of economic scheduling when the transmission line losses are neglected.	7M	CO1	L2
(b)	A two-bus system is shown in Fig. If a load of 125 MW is transmitted from plant 1 to the load, a loss of 15.625 MW is incurred. Determine the generation schedule and the load demand if the cost of received power is Rs. 24/MWhr. Solve the problem using coordination equations and the penalty factor method approach. The incremental production costs of the plants are $$\frac{dF_1}{dP_1} = 0.025\,P_1 + 15$$ $$\frac{dF_2}{dP_2} = 0.05\,P_2 + 20$$	8M	CO1	L3

| 3(a) | A power system network with a thermal power plant is operating by four generating units. Determine the most economical unit to be committed to a load demand of 8MW when (i) Unit-1 is only committed (ii) Unit-1 & Unit-2 combination The minimum and maximum generating capacities and cost-curve parameters of the units listed in the following tabular form. | 7M | CO1 | L3 |

Unit Number	Capacity(MW)		Cost-curve parameters		
	Min	Max	a	b	D
1	1.0	14.0	0.74	22.9	0
2	1.0	14.0	1.56	25.9	0
3	1.0	14.0	1.97	29.0	0
4	1.0	14.0	1.36	31.2	0

(b)	Obtain the solution of UC problem by constructing a priority list for the following units Unit-1: $C_1 = 0.002842P_{G1}^2 + 8.46P_{G1} + 600.0$ Rs/hr, $200 \le P_{G1} \le 650$ Unit-2: $C_2 = 0.002936P_{G2}^2 + 8.32P_{G2} + 420.0$ Rs/hr, $150 \le P_{G2} \le 450$ Unit-3: $C_3 = 0.006449P_{G3}^2 + 9.884P_{G3} + 110.0$ Rs/hr, $100 \le P_{G3} \le 300$	8M	CO1	L3

4(a)	Derive the block diagram of generator-load model of a single area system.	7M	CO2	L2
(b)	Two generators of rating 100 and 200 MW are operated with droop characteristics of 6% from no load to full load. Determine the load shared by each generator, if a load of 270 MW is connected across the parallel combination of those generators.	8M	CO2	L3

5(a)	Discuss the rise of voltage drop with shunt compensation.	7M	CO2	L2
(b)	Illustrate the objectives of load compensation in power system.	8M	CO3	L2

6(a)	Describe any two models of market structure in power industry.	8M	CO4	L2
(b)	Discuss the locational marginal pricing mechanism in deregulated power systems.	7M	CO4	L2

7(a)	Three power plants of total capacity of 500 MW are scheduled for operation to supply total system load of 350 MW. Find the optimum scheduling if plants have incremental cost characteristics of $\dfrac{dc_1}{dP_1} = 40 + 0.25P_1$; $30 \le P_1 \le 150$ $\dfrac{dc_2}{dP_2} = 50 + 0.3P_2$; $40 \le P_2 \le 125$ $\dfrac{dc_3}{dP_3} = 20 + 0.2P_3$; $50 \le P_3 \le 225$	7M	CO1	L3
(b)	Discuss the main parts of speed governing system with neat diagram.	8M	CO2	L2

8(a)	Illustrate the operation of STATCOM with neat diagram.	7M	CO3	L2
(b)	Describe the types of hydro-thermal coordination.	8M	CO1	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S385-SOLID STATE DRIVES
(EEE)

Time : 3 hours

Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	What are the parts of an electrical drive?	1M	CO1	L1
(b)	Which speed control method is preferred for constant torque drive?	1M	CO1	L1
(c)	What is closed loop control systems?	1M	CO1	L1
(d)	Where the rotor resistance control used?	1M	CO3	L1
(e)	Give the application of CSI fed synchronous motor.	1M	CO3	L1
(f)	Specify the functions of power modulator.	2M	CO1	L1
(g)	Compare electrical and mechanical braking.	2M	CO1	L2
(h)	What are the advantages of V/F control?	2M	CO3	L1
(i)	What is static Kramer drive?	2M	CO3	L1
(j)	Mention the two modes employed in variable frequency control of synchronous motor.	2M	CO1	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Analyze the operation of 3- Φ full converter dc series motor drive and draw input voltage, output voltage and current waveforms.	7M	CO1	L4
(b)	The speed of 150HP, 650V, 1750 rpm separately excited dc motor is controlled by 3-φ full converter. The converter is operating from a 3-φ, 460V 50Hz supply. The rated armature current of the motor is 170A. the motor parameters are R_a= 0.099 Ω L_a=0.73mH and $k_a\phi$=0.33. neglect the losses in converter system. Determine the following (i) No load speeds at firing angles α=0⁰ and α=30⁰. Assume that at no load the armature current is 10% of rated current and is continuous (ii) The firing angle to obtain rated speed of 1750 rpm of rated motor current also computes the supply power factor (iii) The speed regulation for the firing angle obtained in part (ii)	8M	CO2	L3
3(a)	Describe the operation of a four- quadrant transistorized chopper drive for control of dc series excited motor.	7M	CO1	L2
(b)	A 230V separately excited dc motor takes 50A at a speed of 800rpm. It has armature resistance of 0.4Ω. This motor is controlled by a chopper with an input voltage of 230V and frequency of 500Hz. Assuming continuous condition through out, calculate and plot speed-torque characteristics for: (i) Motoring operation at duty ratios of 0.3 and 0.6. (ii) Regenerative braking operation at duty ratios of 0.7 and 0.4.	8M	CO2	L3

4(a)	Differentiate between voltage source inverter and current source inverter.	7M	CO1	L2
(b)	For a 3Φ Δ connected, 6 pole, 50 Hz, 400V, 925 rpm, squirrel cage IM the parameters are $R_s=0.2\Omega$, $R_r=0.3\Omega$, $X_s=0.5\Omega$, $X_r{}^1=1\Omega$. The motor is fed from a VSI with a constant $\frac{v}{f}$ ratio from 0 to 50 Hz and constant voltage of 400V above 50 Hz frequency. Calculate the (i) Speed for a frequency of 35 Hz and half of full load torque. (ii) Torque for a frequency of 35 Hz and a speed of 650 rpm.	8M	CO3	L3
5(a)	Describe the static Scherbius drive for induction motor with neat sketch.	7M	CO3	L2
(b)	A 3- phase, 400 V, 50 Hz, 10 kW, 960 rpm, 6-pole star connected slip ring induction motor has the following constants referred to the stator. $R_s = 0.4$ ohm; $R_r = 0.6$ ohm; $X_s = X_r = 1.4$ ohm. The motor drives a fan load at 960 rpm. The stator to rotor turns ratio is 2. (i) What resistance must be connected in each phase of the rotor circuit to reduce the speed to 800 rpm? (ii) When the motor is controlled by static rotor resistance control, calculate the value of external resistance, so that motor runs at 800 rpm for a duty ratio of 0.5.	8M	CO3	L3
6.	Discuss in detail with suitable circuit diagram the principle of operation of Self controlled Synchronous motor drive employing load commutated thyristor inverter.	15M	CO1	L2
7(a)	Discuss the torque- speed characteristics of 1- Φ semi converter fed separately excited dc motor drive in continuous current mode.	7M	CO1	L2
(b)	Discuss one quadrant and two quadrant operation of Chopper fed separately excited dc motor drive.	8M	CO1	L2
8(a)	Describe variable frequency control of induction motor to obtain speeds below and above base speed. Derive the necessary equations and draw the speed-torque characteristics.	7M	CO1	L2
(b)	Discuss the static rotor resistance control with neat sketch.	8M	CO3	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S347 POWER SYSTEM PROTECTION
(EEE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	List the different types of faults.	[1M]
(b)	List the merits of static relays.	[1M]
(c)	Define plug setting multiplier.	[1M]
(d)	List the 3 step characteristics of distance relay.	[1M]
(e)	List two important steps for selection of circuit breakers.	[1M]
(f)	Classify protective relays based on technology and function.	[2M]
(g)	Define phase and amplitude of a comparator.	[2M]
(h)	Where are the relays having extremely inverse and very inverse characteristics used?	[2M]
(i)	Recall the affect of power swing on distance relays.	[2M]
(j)	Define restriking and recovery voltages.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Explain in details about primary and backup protection.	[7M]
(b)	Discuss the need and essential qualities of a protection system.	[8M]
3(a)	Describe with neat sketch the working of an induction type directional over current relay.	[7M]
(b)	Discuss the advantages of solid state relays compared with electromechanical relays. What are the limitations of relays based on solid- state devices and how are they over come?	[8M]
4(a)	What is the meaning of restricted earth fault protection? A 10,000kVA, 11/6.6 kV transformer has 11 kV star connected side. The neutral point is earthed through impedance. Calculate impedance magnitude to provide protection to 90 % winding from phase to earth fault.	[8M]
(b)	Explain how arc resistance introduces an error in distance measurement.	[7M]
5(a)	Explain the directional impedance relay by means of its characteristics on R –X plane.	[7M]
(b)	Explain how to provide directional feature of Impedance and Reactance relay. Explain why the directional feature provided for Impedance relay.	[8M]
6(a)	In what aspects is a minimum oil circuit breaker an improvement over the bulk oil breakers.	[7M]
(b)	Discuss the performance of a circuit breaker when capacitive currents are interrupted.	[8M]
7(a)	Explain briefly with schematic diagram, the protective gear for alternators connected to grid against (i) fault between phases and (ii) fault between turns in one of the phase windings.	[8M]
(b)	Three phase 33/6.6 kV transformer is connected star- delta and current transformers on the low voltage side have ratio 300: 5.What will be the ratio of C T on the high voltage side of Merz –Prize protection is to be adopted.	[7M]
8(a)	Explain with a neat sketch the working of a Air blast circuit breaker.	[7M]
(b)	Discuss the recovery rate theory and energy balance theory of arc interruption in a circuit breaker.	[8M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S188-DIGITAL CONTROL SYSTEMS
(EEE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a) Compute the Z-Transform of Unit ramp Sequence. [1M]

(b) Draw the Block diagram of closed loop DCS. [1M]

(c) Draw the block diagram of State space model of Linear Time Invariant Discrete time Control System. [1M]

(d) Write the necessary conditions for the system to be completely state controllable. [1M]

(e) Draw the block diagram of full order observable. [1M]

(f) Evaluate the Inverse Z-transform of $G(Z) = \frac{z}{(z+1)(z-2)}$. [2M]

(g) Solve the following difference equation $y(k-1)-10y(k)=10$. [2M]

(h) Compute STM of first order system described by the state equation $x_1(k+1) = 2x_1(k)$. [2M]

(i) Find the range of K, for which the characteristic Equation $z^2 + 1.5Kz - (K+1) = 0$. [2M]

(j) What are the necessary and sufficient conditions for design of state feedback controller through pole placement? [2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a) What is A/D converter? Discuss different type of A/D converters. [7M]

(b) Find the inverse z-transform of $F(Z) = \frac{z^{-1}}{(1-z^{-1})(1+1.3z^{-1}+0.4z^{-2})}$. [8M]

3(a) What is ZOH circuit? Find the pulse transfer function of ZOH circuit and sketch the frequency response characteristics of ZOH circuit. [8M]

(b) Realize the following pulse transfer functions using direct programming and standard programming method. $F(Z) = \frac{z^3+z^2+10z}{10z^3+10z^2+z+10}$ [7M]

4(a) Obtain the state transition matrix of the following discrete time system x(k+1)=Gx(k)+Hu(k) and y(k)=cx(k), Where $G = \begin{bmatrix} 0 & 1 \\ -2 & -2 \end{bmatrix}$, $H = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$, $c = [0 \quad 1]$. [7M]

(b) Consider the discrete control system represented by
$$G(Z) = \frac{Z^{-1}(1 + Z^{-1})}{(1 + 0.5Z^{-1})(1 - 0.5Z^{-1})}$$
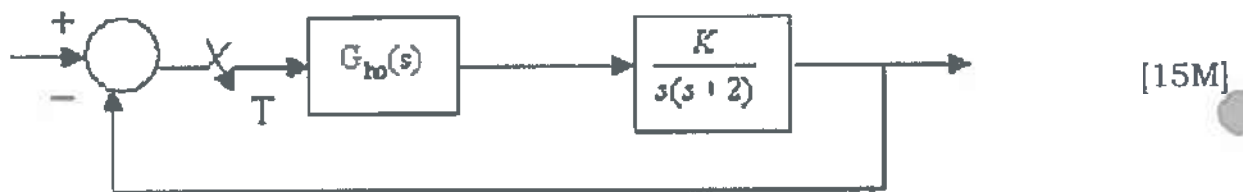Obtain the state space representation in diagonal canonical form. [8M]

5(a) Investigate the controllability and observability of the digital system.
$$x(k+1) = \begin{bmatrix} -1 & 0 \\ 1 & -1 \end{bmatrix} x(k) + \begin{bmatrix} 1 \\ 1 \end{bmatrix} u(k)$$
$$y(k) = [1 \quad 1]x(k)$$
[7M]

(b) Consider the discrete time unity feedback control system (T=1 sec) whose open loop pulse transfer function is given by $(z) = \frac{K(0.3679Z+0.2642)}{(Z-0.3679)(Z-1)}$. [8M]
Determine the range of K for stability by use of the Jury stability test.

6   Consider the system $x(k+1) = Gx(k) + Hu(k)$ $G = \begin{bmatrix} 0 & 1 \\ -0.16 & -1 \end{bmatrix}, H = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$
Determine a suitable state feedback gain matrix 'k' such that the   [15M]
system will have the closed loop poles at $Z = 0.5 \pm 0.5j$.

7   Find the response of the given system if k=1.

[15M]

8   Consider a discrete linear discrete - data control system, whose input –
output relation is described by the difference equation   [15M]
$y(k+2) + 2y(k+1) + y(k) = u(k+1) + u(k)$. Test for state controllable
and output controllable.

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations
S218-ELECTRICAL POWER QUALITY
(EEE)

Time : 3 hours | Max. Marks : 75

PART-A
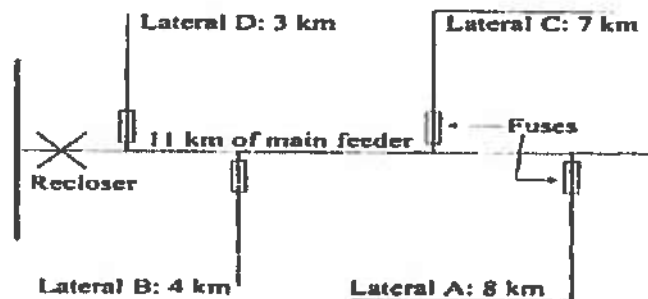### (Compulsory question)

1(a)	What are voltage spikes?	[1M]
(b)	Define SAIFI.	[1M]
(c)	Draw the voltage divider model for voltage sag.	[1M]
(d)	What are odd and even harmonics?	[1M]
(e)	Draw the circuit diagram for Ferro-resonant transformer.	[1M]
(f)	Classify different types of interruptions.	[2M]
(g)	What are the causes of long interruption?	[2M]
(h)	List the methods used for monitoring voltage sag magnitude.	[2M]
(i)	List the power quality measurement devices for harmonics.	[2M]
(j)	Draw the circuit diagram for combined shunt and series voltage controllers.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Interpret the types of considerations in power quality monitoring.	[7M]
(b)	Evaluate the procedure for power quality problems.	[8M]
3(a)	Write short notes on i) Fuse saving ii) Single phase tripping.	[8M]
(b)	The following data is assumed for the system in Fig.	

• The failure rate of the main feeder is: 0.2 faults per year per km of feeder.

• The failure rate of the lateral conductors is: 0.3 faults per year per km of feeder.

• The success rate of the first reclosure is 75%; thus, in 25% of the cases a second trip and reclosure are needed.

• The success rate of the second attempt is 10 % of the number of faults. Thus, for 15% of the faults the second attempt does not clear the fault. Those faults are "permanent faults" leading to a long interruption.

Determine i) total number of faults on the feeder. ii) Number of permanent faults for different parts of the feeder. [7M]

4(a)	Analyze the effects of phase to phase faults in three phase unbalance system.	[7M]
(b)	Define voltage sag and discuss the causes of voltage sag.	[8M]
5.	Discuss the Harmonic Phase Rotation and derive phase angle relationship with neat diagrams.	[15M]
6(a)	Describe the installation process of mitigation equipment.	[7M]
(b)	How to improve the equipment immunity?	[8M]
7(a)	Discuss the remedies to improve power quality.	[8M]
(b)	Illustrate the fundamental principles of protection for sag and interruptions.	[7M]
8(a)	What are the causes of voltage and current harmonics? Discuss.	[7M]
(b)	Analyze the operation of series voltage controller.	[8M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S379-SMART GRID
(EEE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	What are the components of the Smart Grid?	1M	CO1	L1
(b)	What are the Features of Smart meter systems?	1M	CO1	L1
(c)	Write down the Applications of PMU.	1M	CO2	L1
(d)	What is Fuel cell and write down its types?	1M	CO3	L1
(e)	What is mean by Peak Load Management?	1M	CO3	L1
(f)	What are the advantages of Smart Grid Technology ?	2M	CO4	L1
(g)	What are the Communications used in Smart meters?	2M	CO2	L1
(h)	What are the benefits of wide area monitoring system?	2M	CO4	L1
(i)	Write some applications of microgrid.	2M	CO2	L1
(j)	What is NAN and HAN?	2M	CO4	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	Differentiate the resilience grid and self healing grid.	7M	CO1	L2
(b)	Describe the opportunities and challenges relate to smart grid.	8M	CO1	L2
3(a)	Explain how smart meter can be play an important role to make a system smart.	7M	CO2	L2
(b)	How a phase shifting transformer is used to control the real power flow on three - phase electricity transmission network?	8M	CO2	L1
4(a)	Explain the concept of phase measurement unit and also its applications.	7M	CO2	L2
(b)	Explain how the reliability of smart grid can be enhanced by integrating intelligent electronic devices.	8M	CO2	L2
5(a)	Describe and explain the power quality issues Resources of grid connected renewable energy.	7M	CO3	L2
(b)	State and explain the issues of interconnecting the micro grid with utility grid.	8M	CO4	L1
6(a)	Explain web based power quality monitoring.	7M	CO4	L2
(b)	Describe the concept of power quality conditioners related to smart grid.	8M	CO4	L2
7(a)	What is smart substation? Explain the classification of smart substation.	7M	CO1	L1
(b)	What is distribution management system? What is the need of distribution management system in electric power distribution system?	8M	CO3	L1
8(a)	Compare micro-grid and smart-grid.	7M	CO4	L5
(b)	Explain following network architecture types in smart grid communication entities: (i) Neighbourhood Area Network (ii) Wide Area Network	8M	CO4	L2

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B.Tech. VII Semester Regular/Supplementary Examinations

S324-OBJECTED ORIENTED PROGRAMMING THROUGH C++

Time: 3 hours   (EEE)   Max. Marks: 75

PART-A
(Compulsory question)

1(a)	Write the difference between class and structure.	[1M]
(b)	Write the general form of inline functions.	[1M]
(c)	Write about protected access specifier.	[1M]
(d)	What is pure virtual function?	[1M]
(e)	What is the benefit of streams in C++?	[1M]
(f)	Write a C++ program to display the message "Object-Oriented Programming languages".	[2M]
(g)	Write the general form of a class.	[2M]
(h)	What is virtual base class?	[2M]
(i)	Why is this pointer used?	[2M]
(j)	List the stream classes for file operations.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Illustrate about the usage of new operator with example program and give necessary explanation.	[8M]
(b)	Show the support of type casting in C++ with an example program and give necessary explanation.	[7M]
3(a)	Develop a C++ program which initializes data members by using constructor and define a destructor to destroy the object and write necessary explanation.	[8M]
(b)	Demonstrate about Array of objects with an example program and write necessary explanation.	[7M]
4(a)	Explain about inheritance and explain about access of base class members with an example program.	[8M]
(b)	Construct a C++ program to inherit from multiple base classes with an example program and give necessary explanation.	[7M]
5(a)	Construct a C++ program to increment all the data members of a class by using operator overloading and give necessary explanation.	[7M]
(b)	Build a C++ program by making use of function template to swap 2 numbers and give necessary explanation.	[8M]
6.	Demonstrate the use of formatted I/O operations.	[15M]
7(a)	Construct a C++ program which has a member function getData() to read student marks in 4 subjects and display them and also show the accessing of getData() outside the class.	[8M]
(b)	Develop a C++ program to overload a function called add() for 3 times. At fist time the function needs to take 2 arguments , at the second time the function needs to take 3 arguments and at the third time the function needs to take 4 arguments. Write the necessary explanation.[Note: the add() function needs to add the parameters and display the sum]	[7M]
8(a)	Apply exception handling to handle divide by zero with necessary explanation.	[8M]
(b)	Illustrate about static members with an example program and write necessary explanation.	[7M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S295-MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(EEE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	Define Demand Function.	[1M]
(b)	Define Break-Even Point.	[1M]
(c)	Explain Oligopoly.	[1M]
(d)	What is Working Capital?	[1M]
(e)	Define Journal.	[1M]
(f)	Illustrate Total Outlay Method.	[2M]
(g)	Explain Law of returns to scale.	[2M]
(h)	Interpret cost based pricing methods.	[2M]
(i)	List the methods of capital budgeting.	[2M]
(j)	Demonstrate Double-entry book-keeping.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a) 'Managerial Economics is the application of economic theory to business management'. Discuss. [7M]

(b) What do you understand by elasticity of demand? Explain the factors governing it. [8M]

3(a) Discuss briefly the relationship among total product, average product and marginal product with the help of assumed data represent graphically. [7M]

(b) The following are the budgeted data of a Firm.
Sales   Rs.6,00,000/-,   Variable   cost   Rs.3,00,000/-,   Fixed   cost   Rs.1,80,000/-. Find out the Break Even Point: i) At the given data, ii) Assuming 20% increase in variable cost. [8M]

4(a) Define Monopoly. How are price and output determined under monopoly? [7M]

(b) Illustrate objectives and policies of pricing. [8M]

5(a) Define capital budgeting and the need for capital budgeting. [7M]

(b) Consider the case of the company with the following two investment alternatives each costing 9,00,000. The cost of capital is 10% per year. Which one will you choose under NPV Method? The details of the cash inflows are as follows:

Year	Cash flows (in ₹)	
	Project-1	Project- 2
1	3,00,000	6,00,000
2	5,00,000	4,00,000
3	6,00,000	3,00,000

[8M]

6(a) Define financial accounting and discuss various concepts of accounting. [7M]

(b) From the following information of a company, calculate
i) Current Assets, ii) Quick Assets and iii) Inventory
Current Ratio = 2.5 : 1
Quick Ratio = 1.5 : 1
Current Liabilities Rs.50,000/- [8M]

7. The proposals in respect of the following two projects are to be examined using (i) Pay back method and (ii) Accounting Rate of Return method.
Initial investment for both projects is Rs.20,000. Estimated cash flows:

Year	Proposal I	Proposal II
1	12500	11750
2	12500	12250
3	12500	12500
4	12500	13500

[15M]

8. Following is the trail balance of Mr. Suresh as on 31st March 2018. Prepare Trading and Profit and Loss Account and Balance Sheet.

Debit Balances	₹	Credit Balances	₹
Salaries	6,000	Capital	25,000
Purchases	26,000	Sales	47,000
General expenses	8,500	Creditors	21,000
Wages	800	Bills payable	7000
Carriage on purchases	400		
Commission	600		
Carriage on sales	1,200		
Debtors	30,000		
Furniture	3,000		
Machinery	10,000		
Bills receivable	2,000		
Insurance	400		
Opening stock	7,000		
Cash in hand	500		
Cash at bank	3,600		
	1,00,000		1,00,000

Adjustments:
i) Closing stock ₹11000, ii) Outstanding Salaries ₹2000, iii) Prepaid insurance ₹50 [15M]

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B.Tech. (VI Semester) ~~Regular~~/Supplementary Examinations

S313-MICROPROCESSORS AND MICROCONTROLLERS

Time : 3 hours   (EIE)   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	Write the addressing mode of the instruction ADD BL,89H.	[1M]
(b)	How to operate 8086 in maximum mode of operation?	[1M]
(c)	List out the registers present in 8257.	[1M]
(d)	What is the purpose of RXRDY pin of 8251?	[1M]
(e)	List out various Serial Data transmission modes in 8051.	[1M]
(f)	Illustrate any two arithmetic instructions of 8086.	[2M]
(g)	What is the function of M/IOI and WRI signals of 8086?	[2M]
(h)	Give the use of Read/write control logic in 8255.	[2M]
(i)	Specify the role of ISR in Interrupt controller.	[2M]
(j)	Discuss the TMOD register of microcontroller.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Outline the function of pins that are unique to minimum mode of 8086.	[8M]
(b)	Develop an Assembly language program to sort out an array of bytes into Ascending order.	[7M]
3(a)	Demonstrate the I/O write cycle with the help of a timing diagram.	[8M]
(b)	Design an 8086 system with 256KB RAM from 60000H and 64 KB EPROM ending at FA000H.	[7M]
4(a)	Generate an assembly language program to display 1234 on a 4 digit common anode Display interfaced to a PPI.	[8M]
(b)	Construct an 8086 based circuit by interfacing a 16 channel, 8 bit ADC to a PPI.	[7M]
5(a)	Generate initialization sequence of 8251 to operate in asynchronous mode with 8-bit character size, baud rate factor 64, two stop bits and odd parity enable. The 8251 is interfaced with 8086 at address 082H.	[8M]
(b)	Analyze the working of the following modes of 8259 for priority alteration. i) Automatic rotation. ii) Special fully nested mode.	[7M]
6(a)	Develop an Assembly language program to count 7500 pulses using T1.	[8M]
(b)	Summarize the alternate functions of Port-0, Port-2 and Port-3.	[7M]
7(a)	Demonstrate the memory organization of 8051.	[8M]
(b)	Compare the modes of PPI 8255 for an application.	[7M]
8(a)	Illustrate the following instructions of 8086. i) DAA ii) AAM iii) XLAT iv) DIV.	[8M]
(b)	Examine the operational command words required for 8259 in an 8086 based system.	[7M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S419-VLSI DESIGN
(E E)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No.	Questions	Marks	CO	BL
1(a)	Outline any four scaling factors of a MOS device.	1M	CO1	L2
(b)	Construct the stick diagram for CMOS three-input NOR gate.	1M	CO2	L3
(c)	Choose the equation for propagation of carry in CLA.	1M	CO3	L6
(d)	Discuss with an example for regularity in structured design strategies.	1M	CO4	L6
(e)	Identify the fault models in CMOS.	1M	CO5	L3
(f)	Show the comparison between Bi-CMOS and CMOS.	2M	CO1	L2
(g)	Develop the stick diagram for NMOS inverter.	2M	CO2	L3
(h)	Design a Transmission Gate based D- flip-flop.	2M	CO3	L6
(i)	Elaborate about logic optimization.	2M	CO4	L6
(j)	Model controllability in manufacturing test principle.	2M	CO5	L3

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No.	Questions	Marks	CO	BL
2(a)	Illustrate the IC production process concept of 'Photolithography'.	7M	CO1	L2
(b)	Interpret the threshold voltage and body effect with required equations.	8M	CO1	L2
3(a)	Utilize the nature of a parity generator and design stick diagram for unit cell.	7M	CO2	L3
(b)	Model the rise time and fall time of CMOS inverter.	8M	CO2	L3
4(a)	Develop an up/down counter using adder and D-latch.	7M	CO3	L6
(b)	Build modified Booth's multiplier.	8M	CO3	L6
5(a)	Compile in detail about design capture tools.	7M	CO4	L6
(b)	Elaborate about all available design verification tools.	8M	CO4	L6
6(a)	Construct automatic test pattern generation with relevant examples.	7M	CO5	L3
(b)	Identify the scan based test techniques.	8M	CO5	L3
7(a)	Illustrate the latch up in CMOS circuits.	7M	CO1	L2
(b)	Identify the alternative forms of pull ups.	8M	CO1	L2
8(a)	Model sheet resistance and area capacitance.	7M	CO2	L3
(b)	Design a serial/parallel multiplier using data processing elements.	8M	CO3	L6

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S148- BIO MEDICAL INSTRUMENTATION
(EIE)

G.N.d

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	List the different types of biochemical electrodes.	1M	CO1	L1
(b)	Define stimulation.	1M	CO4	L1
(c)	Define fibrillation.	1M	CO3	L1
(d)	Define micro shock.	1M	CO2	L1
(e)	What is hypoventilation?	1M	CO5	L1
(f)	Define depolarization and repolarization.	2M	CO1	L1
(g)	Draw Einthoven triangle and describe the purpose of it.	2M	CO3	L2
(h)	Discuss about short wave diathermy.	2M	CO4	L2
(i)	Describe the working principle of ultrasonic transducer.	2M	CO2	L2
(j)	Define total lung capacity and vital capacity.	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	What are the problems encountered with measurements from human beings? Explain any three in detail.	7M	CO1	L2
(b)	Illustrate in detail about action potential and resting potential of a cell with neat diagrams.	8M	CO1	L3
3(a)	With neat sketch describe about EEG 10-20 electrode system.	7M	CO4	L2
(b)	Explain about ECG machine with neat block diagram.	8M	CO3	L2
4(a)	Describe about pacemaker. Differentiate internal pacemaker and external pacemaker.	7M	CO4	L2
(b)	Illustrate the working principle of electromagnetic blood flow meter with neat diagram.	8M	CO3	L3
5(a)	Explain the working principle of spectrophotometer with neat diagram.	7M	CO2	L2
(b)	Illustrate in detail about computer tomography imaging system.	8M	CO2	L3
6(a)	Describe in detail about ventilators.	7M	CO5	L2
(b)	Explain the working principle of spirometer.	8M	CO5	L2
7(a)	Illustrate the following with diagrams (i) Micro electrode (ii) Skin surface electrode.	8M	CO1	L3
(b)	Describe about EMG machine with neat block diagram.	7M	CO4	L2
8(a)	Explain any two indirect measuring techniques for blood pressure measurement.	7M	CO3	L2
(b)	Analyze the physiological effects of current.	8M	CO1	L4

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S340-PLC AND SCADA
(EIE)

Time : 3 hours   Max.Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	What is PLC?	1M	CO1	L1
(b)	Draw the Ladder Logic for NAND Gate.	1M	CO2	L6
(c)	What is Human Machine Interface?	1M	CO3	L1
(d)	Explain few Advantages of SCADA system.	1M	CO4	L2
(e)	What is meant by PROFIBUS?	1M	CO5	L1
(f)	Explain the SCAN cycle of PLC.	2M	CO1	L2
(g)	Explain the concept of LATCHING with an example.	2M	CO2	L2
(h)	State applications of SCADA.	2M	CO3	L1
(i)	Explain about Power supply module for RTU.	2M	CO4	L2
(j)	What is meant by CIP Protocol?	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	Explain the selection criteria for PLC in detail.	7M	CO1	L2
(b)	Explain the Internal Architecture of PLC with neat sketch.	8M	CO1	L2
3(a)	Explain in detail about types of TIMER with their timing diagrams.	7M	CO2	L2

(b)	Develop a ladder diagram for the following:
	i) X1-ON --→ Y1-ON, Y2-ON
	      X2-ON --→ Y2-OFF, Y3-ON
	      X3-ON --→ Y4-ON, Y1-OFF
	ii) X1-ON -→ Y1-ON
	      X1-OFF -→ Y1-ON, Y2-ON
	      X1-ON -→ Y1-OFF, Y2-ON, Y3-ON
	      X1-OFF -→ Y2-ON, Y3-ON, Y4-ON
		8M	CO2	L6

4(a)	Explain the process of Evolution of SCADA in detail.	7M	CO3	L2
(b)	Explain the following: (i) SCADA Software (ii) SCADA Hardware.	8M	CO3	L2
5(a)	Explain various functions of Data Acquisition System in detail.	8M	CO4	L2
(b)	Explain the features and functions of SCADA and explain the role of Remote Terminal Unit in Data Acquisition.	7M	CO4	L2
6(a)	Explain layered architecture of IEC61850.	7M	CO5	L2
(b)	Explain about the need of Communication Protocols.	8M	CO5	L2
7(a)	Write short notes on Distributed Control Systems and compare it with PLC & SCADA.	7M	CO4	L1
(b)	Explain briefly about Solid State Memory and CPU Processor.	8M	CO1	L2
8(a)	Write the Truth table and Ladder diagram for Half Subtractor and Full Subtractor.	7M	CO2	L2
(b)	Explain DNP3 protocol.	8M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S344-POWER PLANT INSTRUMENTATION
(EIE)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	List the basic conversions of generating electricity from solar energy.	[1M]
(b)	What is the use of pulverizer system?	[1M]
(c)	What is the use of ventilator valve?	[1M]
(d)	Define controller.	[1M]
(e)	What are the fossil fueled technologies?	[1M]
(f)	What are the conventional (Non renewable) electrical energy sources?	[2M]
(g)	Why super heater is used in thermal power plant?	[2M]
(h)	What are the Valves used in steam turbine generator?	[2M]
(i)	Sketch the turbine follow scheme.	[2M]
(j)	How the MHD works?	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	How the Duel biomass-diesel generating unit works? Describe with neat Schematic diagram.	[8M]
(b)	Differentiate Non conventional energy sources with conventional energy sources.	[7M]
3(a)	Identify the flue gas emissions from pulverized coal boilers.	[7M]
(b)	Assess the feed water quality and steam purity.	[8M]
4(a)	What is cooling pond? With a neat schematic diagram describe the helper tower cooling system.	[7M]
(b)	Define recirculating cooling system? Describe the recirculating cooling water system with a schematic diagram.	[8M]
5(a)	Make use of on-off control what are the applications in power plants?	[8M]
(b)	What is modulating (closed loop) control? Describe the basic elements of the loop.	[7M]
6(a)	Describe the power generation from photovoltaic cell.	[8M]
(b)	Explain the working of solar thermal electric generator concepts.	[7M]
7(a)	Describe the role of ID fan and FD fan in thermal power plant.	[7M]
(b)	What are the types of turbine stages? Describe the working of impulse state.	[8M]
8.	Draw the layout of the thermal power plant and describe the functioning of each block.	[15M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S157-CLOUD COMPUTING
( )
(IT)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	List out the features of PaaS.	[1M]
(b)	What do you mean by VM migration?	[1M]
(c)	What is Cloud bursting?	[1M]
(d)	List the essential characteristics of cloud computing.	[1M]
(e)	Write about elasticity and virtual administration in cloud.	[1M]
(f)	What is hypervisor? How do you explain its role in cloud computing?	[2M]
(g)	In how many ways a VM can be provisioned? Mention them.	[2M]
(h)	Mention the use of Resource Pool Manager in Aneka.	[2M]
(i)	What is the use of Task Programming Model in Aneka?	[2M]
(j)	Mention the features of federation Types.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Define Cloud Computing. Express its roots.	[10M]
(b)	Distinguish different deployment models of Cloud computing.	[5M]
3(a)	Describe VM Provisioning process with neat diagram.	[7M]
(b)	How do you explain about VM migration techniques?	[8M]
4(a)	What are the design and implementation guidelines for Hybrid Cloud Implementation?	[8M]
(b)	How do you explain Aneka Hybrid Cloud Architecture?	[7M]
5.	Draw and explain the architecture of work flow management system.	[15M]
6.	Explain about the load balancing and admission control for ensuring QoS.	[15M]
7.	Describe briefly about challenges and risks involved in cloud computing.	[15M]
8(a)	How do you explain Autonomic Cloud bursts using Comet Cloud?	[7M]
(b)	Write a short notes on Autonomic Cloud Bridging in Comet Cloud.	[8M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S130-ANDROID APPLICATION DEVELOPMENT
(IT)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Define Android.	1M	CO1	L1
(b)	What is a View?	1M	CO2	L1
(c)	What is Android Manifest.xml?	1M	CO3	L1
(d)	Define Raw Query.	1M	CO4	L1
(e)	Define Network.	1M	CO5	L1
(f)	Differentiate Android OS & Symbian OS.	2M	CO1	L2
(g)	List out the Activity states.	2M	CO2	L1
(h)	Write the purpose of XML based Layout.	2M	CO3	L2
(i)	Explain Ants and Jars.	2M	CO4	L2
(j)	Explain when not to use alarms.	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	Explain the challenges faced in Android app development.	7M	CO1	L2
(b)	List all the versions of android. Explain more features of Android version.	8M	CO1	L2
3(a)	List out the Activity States. Explain the activity life cycle in detail.	7M	CO2	L2
(b)	Illustrate the following in detail : (i) SDK (ii) Android Widgets (iii) Data Binding (iv) Event Broadcasting.	8M	CO2	L3
4(a)	What is AndroidManifest.xml? Write its usages with an appropriate example.	7M	CO3	L2
(b)	What is a Menu? List out the types of Menus. Explain implementation of app bar & options menu.	8M	CO3	L2
5(a)	Define SQLite. Explain example table for SQLite store data in tables.	7M	CO4	L2
(b)	With an example, explain how do you use raw Query() and query() in Android SQLite.	8M	CO4	L3
6(a)	What is Broadcast Receiver? How do you create Broadcast Receiver?	7M	CO5	L5
(b)	How to create Custom tabs and custom animated popup panels? Explain.	8M	CO5	L5
7(a)	What are resources? Explain any two resource type with an appropriate example for each.	7M	CO2	L2
(b)	What do you mean by Activity stack? Explain with an appropriate diagram.	8M	CO2	L4
8(a)	Explain the steps for sending the implicit intents.	7M	CO2	L2
(b)	Demonstrate the steps to create a home screen app widget.	8M	CO5	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S382-SOFTWARE PROJECT MANAGEMENT
(IT)

Time : 3 hours

Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	What is Software project management?	1M	CO1	L1
(b)	Which are the primary objectives for construction phase?	1M	CO2	L1
(c)	Define the term work flow.	1M	CO3	L1
(d)	What is software Metric?	1M	CO4	L1
(e)	Expand the term CCPDS.	1M	CO5	L1
(f)	How to reduce software product size?	2M	CO1	L3
(g)	Write short note on inception phase.	2M	CO2	L1
(h)	Explain about WBS.	2M	CO3	L2
(i)	Discuss about process Automation.	2M	CO4	L2
(j)	Differentiate small scale project versus large scale project.	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Describe in detail about waterfall model.	7M	CO1	L2
(b)	What are the basic parameters of software Economics?	8M	CO1	L1
3(a)	Explain software Architecture in terms of management Perspective.	7M	CO2	L2
(b)	Describe about Engineering and programmatic Artifacts.	8M	CO2	L2
4(a)	What are the planning guidelines for WBS?	7M	CO3	L1
(b)	List out different work flows.	8M	CO3	L1
5(a)	Explain about software development team activities.	7M	CO4	L2
(b)	Discuss about the building blocks of process Automation.	8M	CO4	L2
6(a)	Evaluate process Discriminators that result from differences in stake holder cohesion.	7M	CO5	L5
(b)	Describe about future software project management.	8M	CO5	L2
7(a)	Explain Barry Boehm Industrial software metrics.	7M	CO1	L2
(b)	What are the modern process approaches for solving conventional problems?	8M	CO1	L4
8(a)	Differentiate engineering stage and product stage.	7M	CO2	L2
(b)	Explain about construction phase.	8M	CO2	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S250-FINITE ELEMENT METHOD
(ME)

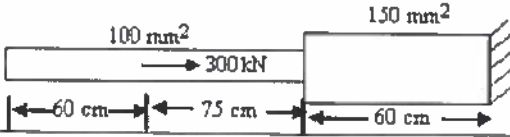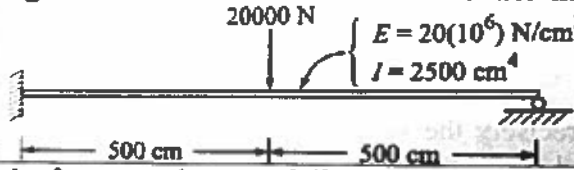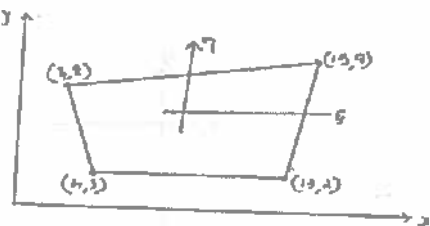Time : 3 hours   Max. Marks : 75
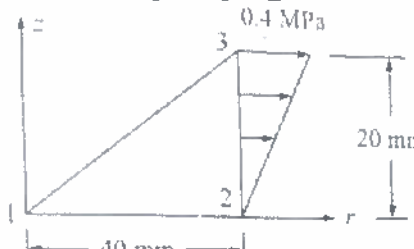
PART-A
(Compulsory question)
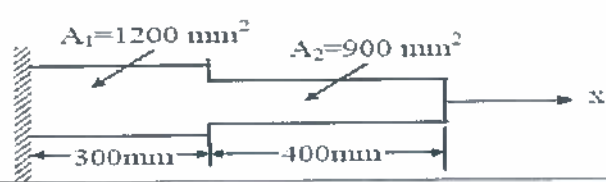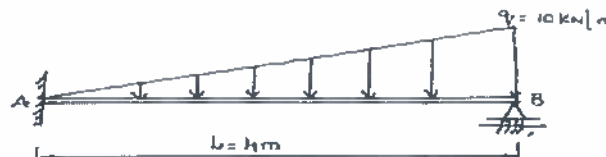
Q.No	Questions	Marks	CO	BL
1(a)	Enumerate the types of elements used in finite element method.	1M	CO1	L1
(b)	Give the expression for element stiffness matrix for CST.	1M	CO2	L2
(c)	Define the term iso-parametric element.	1M	CO3	L2
(d)	Identify the field variable in heat transfer problems.	1M	CO4	L2
(e)	Reveal the expression for consistent mass matrices of a bar element.	1M	CO5	L1
(f)	If E=200 GPa and μ=0.3, find the material property matrix [D] for a plane strain problem.	2M	CO1	L3
(g)	List out the ways in which a 3D problem can be reduced to a 2D problem.	2M	CO2	L2
(h)	Write the expression for shape functions in a four node quadrilateral element.	2M	CO3	L2
(i)	Mention various practical applications of fins.	2M	CO4	L1
(j)	Reveal the required condition for when the Eigen vector is to be non-trivial.	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	A stepped bar is subjected to an axial load of 300 kN as shown in figure. How would you justify the nodal displacements, element stresses and strains and reactions? Take E =2×10^5 N/mm^2. The cross sectional areas are 100 mm^2 and 150 mm^2.	8M	CO1	L4
(b)	Develop the element stiffness matrix for a one dimensional bar element using potential energy method.	7M	CO1	L3
3.	A beam fixed at one end and supported by a roller at the other end, has a 20 kN concentrated load applied at the centre of the span as shown figure. Calculate the deflection under the load for the beam. $E = 20(10^6)$ N/cm^2 $I = 2500$ cm^4	15M	CO2	L4
4(a)	A four node quadrilateral element is shown in figure, the nodal displacements vector is given by Q= [0, 0, 0.15, 0.10, 0.10, 0.125, 0.20, 0]^T cm. Justify the following (i) The X & Y coordinates of a point 'P' whose location in the element is given by ξ=0.5, η=0.5 and (ii) the u, v displacements of the point 'P'.	7M	CO3	L3

(b)	For an axi-symmetric element as shown in figure, evaluate the nodal forces used to replace the linearly varying surface traction.	8M	CO3	L4
5.	A metallic fin, with thermal conductivity 360 W/m °C, 0.1 cm thick and 10 cm long extends from a plane wall whose temperature is 235°C. Determine the temperature distribution along the fin if heat is transferred to ambient air at 20°C with heat transfer coefficient of 9 W/m² °C. Take width of the fin as 1 m. Use two elements and obtain the solution.	15M	CO4	L5
6(a)	Consider axial vibration of the steel bar shown in figure below. (i) Develop the global stiffness and consistent mass matrices (ii) find the natural frequencies? Assume, E=210 GPa.	8M	CO5	L4
(b)	Elucidate the following with examples. (i) Lumped mass matrix model (ii) Consistent mass matrix model.	7M	CO5	L2
7(a)	Estimate the temperature distribution in a circular tapered fin, varies the diameter from 4cm to 1cm over the length of 1m. The convection takes place on lateral surface as well as tip of the fin. Assume K=200W/m°C, h=980/m² °C and ambient air temperature =22° C.	8M	CO4	L4
(b)	Enumerate the advantages and engineering applications of finite element method.	7M	CO1	L2
8(a)	A beam subjected to the linearly varying load q=10kN/m as shown in figure. Determine rotation at the roller support. Given, L=4m, I=4x10⁻⁴ m⁴ and E=200GPa.	8M	CO2	L4
(b)	Estimate Jacobian determinant [J] of the two dimensional 4 noded element as shown in figure.	7M	CO3	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S367-REFRIGERATION AND AIR CONDITIONING
(ME)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	What is meant by coefficient of performance?	1M	CO1	L1
(b)	List out the basic components of a Vapour compression refrigeration (VCR) system.	1M	CO1	L2
(c)	What are the various non-conventional refrigeration methods?	1M	CO3	L1
(d)	Define the term relative humidity.	1M	CO4	L1
(e)	What do you mean by year round air conditioning?	1M	CO5	L2
(f)	What are the chemical formulas of the refrigerants R-11 and R-12?	2M	CO3	L3
(g)	Compare between the air cooled and water cooled condensers.	2M	CO1	L4
(h)	List out the key components in a VAR system.	2M	CO1	L2
(i)	Define the term by-pass factor used for cooling coil and find the expression for that.	2M	CO5	L1
(j)	Define the terms: (i) SHF and (ii) ADP.	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	List the desirable properties of an ideal refrigerant.	7M	CO3	L2
(b)	An ice plant produces 12 tonnes of ice per day at 0 ^{0}C using water at room temperature of 20 ^{0}C. Estimate the power rating of the compressor motor if COP of the plant is 3 and over all electro mechanical efficiency is 90%.	8M	CO2	L3
3(a)	Illustrate the working of thermostatic expansion valve.	7M	CO1	L1
(b)	A vapour compression refrigerator works between the pressure limits of 60 bar and 25 bar. The working fluid is dry saturated at the end of the compression and there is no under cooling of the liquid before the expansion. Estimate: i) COP of the cycle and ii) Capacity of the refrigerator if the fluid flow is at the rate of 5 kg/min.	8M		L5

Pressure (bar)	Saturation Temp (K)	Enthalpy (kJ/kg)		Entropy (kJ/kg.K)	
		Liquid	Vapour	Liquid	Vapour
60	295	151.96	293.29	0.554	1.0332
25	261	56.32	322.58	0.226	1.2464

CO2

4(a)	Construct the lithium bromide water absorption refrigeration system and explain its working principle.	7M	CO1	L2
(b)	Apply the principle of VAR system to evaluate the COP, when the temperature of generator is 120 °C, temperature of condenser is 30 °C and temperature of evaporator is -20 °C. What would be its COP, if it is a Carnot refrigerator?	8M	CO2	L5
5(a)	Sketch the psychrometric chart and explain the properties of moist air and its representation on psychrometric chart.	7M	CO4	L4
(b)	Air in a room has DBT=26 °C, RH=50%. Using Psychrometric chart, determine: i) Wet Bulb Temperature, ii) Specific humidity, iii) Dew point Temperature, iv) Enthalpy.	8M	CO4	L3
6(a)	Demonstrate the different types of heat loads which have to be taken into account in order to estimate the total heat load of a large restaurant for summer air conditioning.	7M	CO5	L4
(b)	Explain the working principle of summer air conditioning system with neat sketch.	8M	CO5	L2
7(a)	Develop an expression for COP of a refrigerator working on Bell-Coleman cycle.	7M	CO1	L2
(b)	Draw the T-S and h-S diagram for a steam jet refrigeration system and write the expressions for (i) Nozzle efficiency (ii) Entrainment efficiency iii) compression efficiency.	8M	CO1	L4
8(a)	Differentiate between the Actual VCR cycle and ideal VCR cycle with the help of p-h diagram.	7M	CO1	L4
(b)	900 kg/hr of return air at 24 °C DBT and 60% RH is mixed with 100 kg/hr of fresh air at 40 °C DBT and 30% RH. Evaluate the final conditions of the mixture.	8M	CO2	L3

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S310-METROLOGY AND INSTRUMENTATION
(ME)

Time : 3 hours

Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	What is resolution?	1M	CO1	L1
(b)	What is least count?	1M	CO2	L1
(c)	Define tolerance.	1M	CO3	L1
(d)	List out the arrangements for compensating strain due to temperature.	1M	CO4	L1
(e)	Define boyle's law.	1M	CO5	L1
(f)	Differentiate precision and accuracy.	2M	CO1	L2
(g)	Explain the process of wringing.	2M	CO2	L2
(h)	Write the necessary condition for clearance fit.	2M	CO3	L2
(i)	What is the working principle of Wheatstone Bridge?	2M	CO4	L2
(j)	List out the instruments used for the flow measurement.	2M	CO5	L2

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Differentiate between Direct and Indirect methods of measurement.	7M	CO1	L2
(b)	Illustrate the process of curve fitting by method of least squares.	8M	CO1	L2
3(a)	Explain the construction, working and uses of the universal bevel vernier protractor.	7M	CO2	L3
(b)	What is optical flat? Explain how interference fringes are formed when optical flat is placed on a surface to be tested.	8M	CO2	L3
4(a)	Describe the various elements of surface texture with neat sketch.	7M	CO3	L2
(b)	Determine and sketch the limits of tolerance and allowance for a 60mm shaft and hole pair designated H7 – k8. The basic size lies in the range of 50-80mm. The multipliers for grades 7 and 8 are 16 and 25 respectively. The fundamental deviation for 'k' shaft is $+0.6D^{0.33}$ microns. $i = 0.45(D)^{(1/3)}+0.001D$.	8M	CO3	L4
5(a)	Describe the working of a resistance strain gauge with a neat sketch.	7M	CO4	L2
(b)	How the dynamometers are classified? Explain.	8M	CO4	L2
6(a)	Illustrate the working principle of Bourdon tube pressure gage.	7M	CO5	L2
(b)	Exemplify the flow measurement by using Laser Doppler Anemometry.	8M	CO5	L2
7(a)	Illustrate the generalized measurement system and its functional elements.	7M	CO1	L1
(b)	Describe the method of checking the angle of a taper plug gauge using rollers, micrometer and slip gauges.	8M	CO2	L3
8(a)	Differentiate between hole basis system and shaft basis system.	7M	CO3	L2
(b)	Describe with neat sketch working principle of resistance thermometer.	8M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S138-AUTOMATION IN MANUFACTURING
(ME)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Identify any three situations where manual labour is preferred than automation.	1M	CO1	L1
(b)	Define Reciprocating conveyor.	1M	CO2	L1
(c)	Explain how manning level is correlated with automation level.	1M	CO3	L2
(d)	Justify the use of storage buffers in manual assembly lines.	1M	CO4	L5
(e)	Why storage buffers used in partially automated production lines?	1M	CO5	L1
(f)	Differentiate process parameters and process variables.	2M	CO1	L2
(g)	Compare the Rail Guided Vehicles (RGV's) and Automated Guided Vehicles (AGV's).	2M	CO2	L5
(h)	Identify the functions of computer control system in manufacturing systems.	2M	CO3	L1
(i)	List out the industrial applications of Automated Production Line.	2M	CO4	L1
(j)	List out the important performance measures for automated production lines.	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Describe the Automation migration strategy with examples.	7M	CO1	L2
(b)	List the basic elements of automated systems and demonstrate them.	8M	CO1	L1
3(a)	Describe the terms (i) availability (ii) traffic factor.	7M	CO2	L2
(b)	Summarize the various Guidance technologies used in AGV'S with neat sketches.	8M	CO2	L2
4(a)	Describe the following (i) single station cells (ii) multi station system with fixed routing and (iii) multi station system with variable routing.	7M	CO3	L2
(b)	Define unattended cell operation and elucidate the enablers for unattended cell operation.	8M	CO3	L1
5(a)	What is a line pacing? Describe the various types of line pacings.	7M	CO4	L1
(b)	Discuss the various configurations of automated assembly lines.	8M	CO4	L2

6(a)	Discuss the adaptive control with optimization.	7M	CO5	L2
(b)	Demonstrate the parts delivery system.	8M	CO5	L3
7(a)	Why is manning level inversely correlated with automation level in a manufacturing system?	7M	CO4	L1
(b)	Suppose that a total of 50 SKUs must be stored in a storage system. For each SKU, average order quantity = 100 cartons, average depletion rate = 2 cartons/day, and safety stock level = 10 cartons. Each carton requires one storage location in the system. Based on this data, each SKU has an inventory cycle that lasts 50 days. Since there are 50 SKUs in all, management has scheduled incoming orders so that a different SKU arrives each day. Determine the number of storage locations required in the system under two alternative strategies: (i) randomized storage and (ii) dedicated storage.	8M	CO3	L4
8(a)	Name and briefly describe measures used to assess the performance of a storage system.	7M	CO2	L1
(b)	Consider an AS/RS having four aisles. An S/R machine is used for each aisle. Dedicated storage strategy is used for storing the materials. Length of the storage aisle is 280ft and height of storage aisle is 46ft.Suppose the horizontal and vertical speeds of the S/R machine are 200 ft/min and 75 ft/min, respectively. The S/R machine requires 20 sec to accomplish the pickup and deposit operation. Determine (i) single and dual command cycle times per aisle and (ii) throughput per aisle under the assumption tha system utilization = 90% and number of single command cycles and dual command cycles are equal.	8M	CO3	L4

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations
S357-PROJECT MANAGEMENT
(ME)

Time : 3 hours   Max. Marks : 75

PART-A
(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Define systems Approach.	1M	CO1	L1
(b)	What is meant by work break down structure?	1M	CO2	L1
(c)	Quote the areas of application of network techniques.	1M	CO3	L1
(d)	Give the requirements of Budget.	1M	CO4	L1
(e)	What is meant by over head cost?	1M	Co5	L1
(f)	Illustrate the Responsibilities of Project Manager.	2M	CO1	L4
(g)	Give examples for performance requirements.	2M	CO2	L1
(h)	How is GERT different from other scheduling methods.	2M	CO3	L1
(i)	Define Prime Cost.	2M	CO4	L1
(j)	List out risk management methods in detail.	2M	CO5	L1

PART-B
(Answer any FOUR questions. All questions carry equal marks)

Q.No	Questions	Marks	CO	BL
2(a)	Describe the stages in System Engineering.	8M	CO1	L2
(b)	Explain the steps in Project Appraisal process.	7M	CO1	L2
3(a)	Discuss various steps of feasibility study.	7M	CO2	L1
(b)	Where Gantt charts can be used? Explain about work packages project organization structure and responsibilities.	8M	CO2	L1
4(a)	How do you distinguish between resource levelling and resource allocation problem? State and explain an algorithm for resource allocation.	7M	CO3	L2
(b)	Would PERT/CPM models be categorized as planning, scheduling and control tools or as optimization models. Discuss.	8M	CO3	L1
5(a)	Describe various costing methods. What are the characteristics of good management information systems?	8M	CO4	L2
(b)	Explain the concept of cost estimation and cost improvement in project budgeting.	7M	CO4	L2
6(a)	Write a short notes on performance analysis.	7M	CO5	L1
(b)	Explain the use of variance limits in project control. Where it is mostly applicable?	8M	CO5	L2
7(a)	In which cases the project can be terminated – justify your answer with real time examples.	8M	CO5	L5
(b)	Write a short notes on Project Contracting. How it is applied and used in any manufacturing industry?	7M	CO4	L2
8(a)	Write about time estimates for PERT and construct an algorithm.	7M	CO3	L1
(b)	A small project is composed of seven activities whose time estimates are listed in the table below. (i) Draw the project network (ii) Find the expected duration and variance of each activity (iii) Calculate early and late occurrence times for each event. What is expected project length? (iv) Calculate the variance and standard deviation of project length. What is the probability that the project will be completed (A) at least 4 weeks earlier than expected (B) no more than 4 weeks later than expected? (I) If the project due date is 19 weeks, what is the probability of meeting the due date?	8M	CO3	L3

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6
Estimated duration (weeks)	1-1-7	1-4-7	2-2-8	1-1-1	2-5-14	2-5-8	3-6-15

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

S370-RENEWABLE ENERGY SOURCES

Time : 3 hours   (ME)   Max. Marks : 75

PART-A
(Compulsory question)

1(a)	List out the devices used to measure solar radiation.	[1M]
(b)	Justify, wind is an indirect form of solar energy.	[1M]
(c)	What is the minimum tidal range required for a practical tidal plant?	[1M]
(d)	How much optimum solid concentration percentage in biogas?	[1M]
(e)	Give an example of high temperature measuring instruments.	[1M]
(f)	What is mean by diffuse radiation?	[2M]
(g)	Elaborate the generation of local and global winds.	[2M]
(h)	What do you understand by spring and neap tides? How are they caused?	[2M]
(i)	What is the effect of pH value on the performance of a digester?	[2M]
(j)	List the different materials used for fabrication of solar cells.	[2M]

PART-B
(Answer any FOUR questions. All questions carry equal marks)

2(a)	Identify the various energy resources are available in the world.	[8M]
(b)	Elaborate how weather changes on earth with neat diagram.	[7M]
3.(a)	List out the advantages & disadvantages of geothermal energy.	[8M]
(b)	Elaborate the working principle of hot dry rock geothermal power plant.	[7M]
4(a)	Sketch and explain the working of closed cycle OTEC plant.	[8M]
(b)	Give the reasons for the formation of various tides.	[7M]
5(a)	Sketch and explain the process of production of biogas from fixed dome type biogas plant.	[8M]
(b)	Compare and contrast floating drum and fixed dome plants.	[7M]
6(a)	Elaborate the working of Thermionic energy converter.	[8M]
(b)	Differentiate solar cell, solar module, solar panel and solar array with sketch.	[7M]
7(a)	Illustrate the working principle of the followings: (i) Pyrometer (ii) Pyrheliometre	[8M]
(b)	Differentiate between the Beam and Diffuse radiation.	[7M]
8(a)	Discuss in brief types of Geothermal resources.	[8M]
(b)	Exploit the Geothermal power potential availability in India.	[7M]

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