H.T No: | | | | | | | | | | | R18 | Course Code: A30115

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Design and Drawing of RCC Structures
(Civil Engineering)

Date: 24.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1.	Define Characteristic strength and characteristic load.	2 M
2.	Differentiate between working stress method and limit state method.	2 M
3.	Classify flexure bond and Anchorage bond.	2 M
4.	Mention how the shear reinforcement improves the strength of the beam.	2 M
5.	Define one way slab with sketch.	2 M
6.	Mention the necessity of providing corner reinforcement in two way slab.	2 M
7.	Mention the types of column based on materials.	2 M
8.	What are the functions of lateral reinforcement in column?	2 M
9.	Define isolated and combined footing.	2 M
10.	Explain the terms flight and Rise.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain about balanced section as per working stress method and limit state method for design of reinforced concrete structures. 10M

OR

11. B). A T beam has developed an ultimate moment of resistance of 450kNm. Its web width is 200mm, flange width 750mm, slab thickness 100mm and total depth 550mm. Determine the necessary steel for the section using M20 grade concrete and Fe415 steel. Assume cover 50mm. 10M

12. A). Design the shear reinforcement for a beam 350x550. The shear force is 125kN. The percentage of steel is 1.67. Use M25 grade concrete and Fe415 steel. 10M

OR

12. B). Determine the reinforcement required for a beam of size 300 X 600 mm subjected to a factored bending moment of 150 KNm, factored shear force of 100 KN and factored torsional moment of 50 KNm. Use M20 grade of concrete and Fe 415 steel. 10M

13. A). Design an Interior span of continuous one way slab for a class room floor which was continuous tee beams. The beams are spaced at 4mc/c. Take live load 2.5kN/m^2 and inclusive of all dead load is 2.5kN/m^2. Use M20 grade concrete and Fe415 steel. 10M

OR

13. B). Design the R.C. floor slab for a room measuring 5m x 6m. The slab is simply supported on all the four edges, with corners held down and carries a super imposed load of 3.1k N/m^2 inclusive of floor finishes. Use M25 grade concrete and Fe415 HYSD bars. 10M

(P.T.O..)

14. A). Design an axially loaded column 400x400mm pinned at both ends with an unsupported length of 3m to carry a factored load of 2300kN. Use M 20 concrete and Fe 415 steel. 10M

OR

14. B). Design a rectangular column of 400 x 600mm size subjected to characteristic axial load of 2000kN. The column is unsupported length of 3m and is braced against the side sway in both directions. Use M 20 concrete and Fe 415 steel. 10M

15. A). Design the footing for the following data : 10M
Axial Load on column = 2000 KN
Column size = 400 x 600 mm
SBC of soil = 150 kN /m^2
Concrete Mix =M20
Steel Grade = Fe 415.

OR

15. B). Design a dog legged stair case for an office building in a room measuring 3 m X 6 m (clear dimensions). Floor to floor height is 3.5 m. The building is a public building liable to overcrowding. Stairs are supported on brick walls 230 mm thick at the end of loadings. Use M20 concrete and Fe 415 steel. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30116**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Geotechnical Engineering

(Civil Engineering)

Date: 28.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

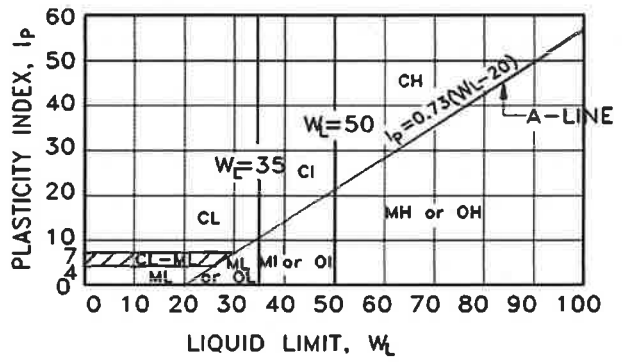
(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. The fine grained soil has liquid limit of 60 and plastic limit of 20. As per the plasticity chart, according to IS classification, the soil is represented by the letter symbols 2 M



2. Differentiate between Flocculated and dispersed structure of soil. 2 M
3. What are the properties of flow net? Explain. 2 M
4. Differentiate between discharge velocity and seepage velocity with the help of diagram 2 M
5. Explain why optimum value of moisture content and maximum value of dry density is considered. 2 M
6. An elevated structure with total weight 13000kN is supported on a tower with four legs. The four legs rest on piers located at the corners of a square 6m on a side. What is the vertical stress increment due to this loading at a point 6m beneath the centre of the structure? 2 M
7. Differentiate between primary consolidation and secondary consolidation. 2 M
8. List any four assumptions made in Terzaghi's theory of one- dimensional consolidation. 2 M
9. List the advantages of Triaxial shear test. 2 M
10. For which type of samples Triaxial and direct shear test is preferred? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). The Atterberg's limits for a clay soil used for an earth dam are liquid limit 60%, plastic limit 40%, and shrinkage limit 25%. If a specimen of the soil of volume 10cm^3 at the liquid limit has a volume of 6.5 cm^3 when dried, what would be the shrinkage ratio of soil particles? 10M

OR

11. B). Explain with neat sketch structure of any two clay minerals. 10M

(P.T.O..)

12. A). The hydraulic conductivity of a soil sample was determined in a soil mechanics laboratory by making use of a falling head permeameter. The data used and the test results obtained were as follows: diameter of sample = 5.36 cm, height of sample = 12.91 cm, diameter of stand pipe = 1.98 cm, initial head h_0 = 44.3 cm, final head h_f = 29.87 cm, time elapsed = 1 min 45 sec. Determine the permeability in m/day. 10M

OR

12. B). Explain the characteristic and uses of a flow net with a neat sketch. 10M

13. A). What is the difference between compaction and consolidation? Explain. Draw and explain a typical graph of compaction curve. Explain the significance of zero air void line. 10M

OR

13. B). Explain Bousssinesq's stress theory for point load. 10M

14. A). A saturated clay stratum 6m thick lies above an impervious stratum and below a pervious stratum. It has a compression index of 0.28 and coefficient of permeability of 3.77×10^{-6} m/sec. The void ratio at an initial stress of 136kN/m^2 is 1.84. The stress when increased to 201kN/m^2 the void ratio reduced to 1.818. Determine the time required for 40% consolidation. 10M

OR

14. B). Following are the results of consolidation test on a soil sample of initial thickness 25 mm, water content of 42% and G=2.9. Calculate the void ratio corresponding to each pressure increment. The least count of dial gauge is 10^{-3} mm. Determine coefficient of volume compressibility and coefficient of compressibility for the pressure increment from 49 kN/m^2 to 98.1 kN/m^2. 10M

Pressure (kN/m^2)	0	20	49	98.1	196	392.4
Change in dial guage reading	0	90	248	408	680	760

15. A). In an unconfined compression strength test a soil has failed at axial stress of 78kN/m^2. In a triaxial compression strength test the specimen of same soil when subjected to a cell pressure of 23kN/m^2 failed at an additional stress of 91kN/m^2. Determine shear strength parameters of the soil and the angle made by the failure plane with minor and major principal plane of the specimen by analytical method. 10M

OR

15. B). What are the advantages of triaxial compression test over direct shear test? Direct shear stress test carried out on a cohesive soil sample gave the following results. 10M

Test 1: Normal stress = 64kPa and Shear stress at failure = 134kPa

Test 2: Normal stress = 92kPa and Shear stress at failure = 150kPa

Estimate the shearing strength parameters. The same sample was subjected to triaxial test. Determine the deviator stress required to induce failure of the soil under a cell pressure of 21 kPa.

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30118**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Structural Analysis-II

(Civil Engineering)

Date: 03.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

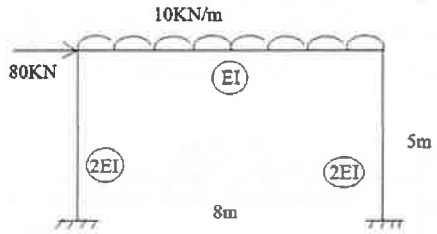
Each question carries TWO marks. **10x2=20M**

1. Distinguish between Carryover factor and rotation factor. 2 M
2. What is the settlement of supports in Kani's method. 2 M
3. Classify the different types of two hinged arches. 2 M
4. What is the effect of rib shortening in two hinged arch? 2 M
5. What are the assumptions made in the portal method? 2 M
6. What are the assumptions made in the cantilever method? 2 M
7. Define the terms Stiffness and Flexibility. 2 M
8. Distinguish between static and kinematic indeterminacy. 2 M
9. What are the uses of influence lines? 2 M
10. State the castigilano's second theorem. 2 M

PART-B

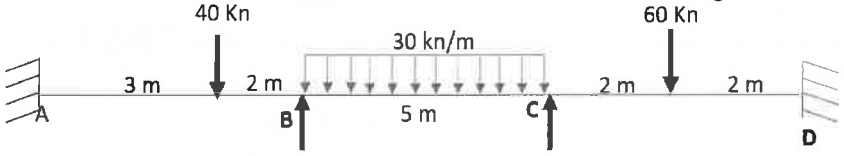
Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Analyze the frame by Moment distribution method. Draw the BMD also 10M

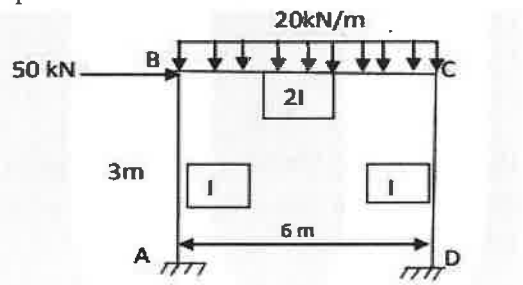


OR

11. B). Draw the SFD and BMD for the continuous beam shown below using Kani's method. 10M



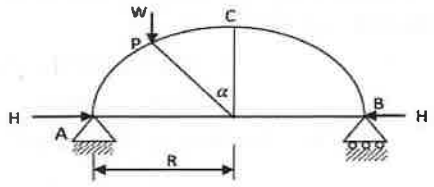
12. A). Analyze the frame by slope deflection method. Draw the BMD also 10M



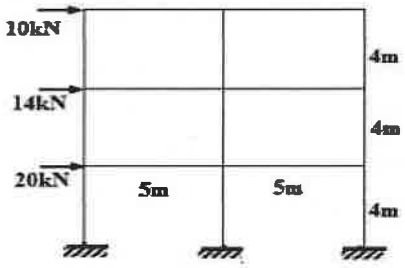
(P.T.O..)

OR

12. B). Determine the horizontal reaction in a semi-circular two hinged arch when a load 'W' acts at a point P as shown in figure below. Assume uniform flexural rigidity. 10M

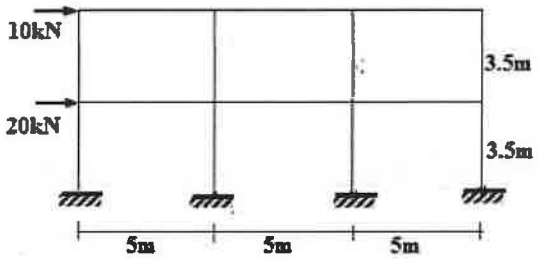


13. A). Analyze the frame using Cantilever method. 10M

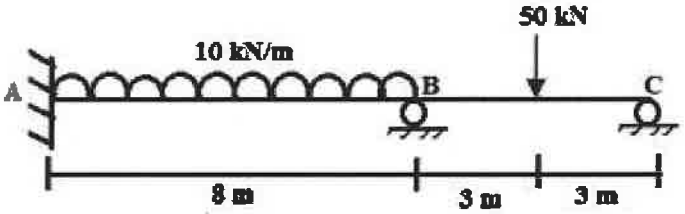


OR

13. B). Analyze the frame using Portal method. 10M

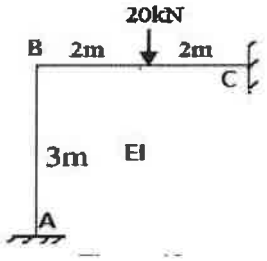


14. A). Analyze the continuous beam shown in figure using Flexibility method and draw the Bending moment diagram. Take EI as constant. 10M



OR

14. B). Analyze the frame by stiffness matrix method, and draw BMD. Take EI as constant. 10M



15. A). Two wheel loads 200 kN and 80kN spaced 0.8m apart roll on a girder of 20m. Find the maximum positive, negative shear force and maximum positive, negative bending moment at the center of the span. 10M

OR

15. B). Derive Castigilano's second theorem. Mention the applications of the theorem. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30117**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Transportation Engineering-I

(Civil Engineering)

Date: 12.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1.	Define highway alignment.	2 M
2.	Write the need of highway planning.	2 M
3.	Define horizontal alignment.	2 M
4.	Illustrate transition curves.	2 M
5.	What is data collection in traffic surveys?	2 M
6.	Write some traffic signs.	2 M
7.	Define channelized intersections.	2 M
8.	Recall the term grade intersection.	2 M
9.	Mention the types of pavements.	2 M
10.	What is the need of joint filler in pavements?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Describe with neat sketches, the various road patterns in detail.	10M
	OR	
11. B).	Discuss in detail the various engineering surveys done for highway.	10M
12. A).	A valley curve is formed due to two gradients +3,5% and -2.75%. if the design speed of this highway is 80kmph, determine the stopping sight distance and design the valley curve to fulfill both comfort and head light distance conditions.	10M
	OR	
12. B).	What are the objectives of widening of road pavement at horizontal curves? Derive an expression for the extra widening.	10M
13. A).	Describe in detail about the parking studies and origin and destination studies along with its applications in traffic engineering.	10M
	OR	
13. B).	Discuss with neat sketches, the various road markings and also write briefly about uses of traffic signs	10M
14. A).	Discuss in detail the need of traffic islands an also explain with neat sketches various traffic islands.	10M
	OR	
14. B).	Discuss in detail the rotary intersection with sketches and its applications	10M
15. A).	Demonstrate the essential properties of good highway materials and also various tests done for materials.	10M
	OR	
15. B).	Discuss the design approach for the surface drainage system of highways	10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30013**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Business Management & Financial Analysis

(Common for CE & CSD)

Date: 26.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Define Management.	2 M
2.	Explain staffing function of Management.	2 M
3.	State the functions of PPC.	2 M
4.	Explain Elements of Marketing Mix.	2 M
5.	Differentiate between Micro & Macro Economics.	2 M
6.	Explain Deflation.	2 M
7.	Differentiate between fixed costs and variable costs.	2 M
8.	Explain the various types of competition.	2 M
9.	Write two objectives of Business Enterprise.	2 M
10.	What is leverage? Explain?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain Functions of Management.	10M
	OR	
11. B).	Discuss the contribution of Henry Fayol and F.W. Taylor to the field of Management.	10M
12. A).	Elaborate the functions of Financial Management.	10M
	OR	
12. B).	Describe the objectives of HR Management.	10M
13. A).	Elucidate the importance of National income.	10M
	OR	
13. B).	What is demand Forecasting? Explain the types and methods of demand forecasting	10M
14. A).	What do you mean by production Function? Discuss various assumptions and limitations.	10M
	OR	
14. B).	Describe the cost-output relationship in the long run.	10M
15. A).	Appraise the various profitability ratios and explain their importance in financial statement analysis.	10M

(P.T.O..)

OR

15. B). The following information is available from the books of Anil co Ltd. for the year ending on December 31, 2023 10M

Opening stock: 30,000
Purchases: 90,000
Sales: 130,000
Wages and Salaries: 18,000
Rent Expense: 15,000
Carriage Inwards: 3000
Carriage Outwards: 1,500
Office Supplies: 2,500
Depreciation on Furniture: 3,000
Bad Debts: 1,500
Provision for Doubtful Debts: 1000
Interest Received: 1,500
Discount Allowed: 1000
Discount Received: 800
Closing stock: 20,000
Taxation: 3,000
Prepare the Trading Account, Profit and Loss Account for Anil co Ltd.

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30211**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Power Systems-II

(Electrical & Electronics Engineering)

Date: 24.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

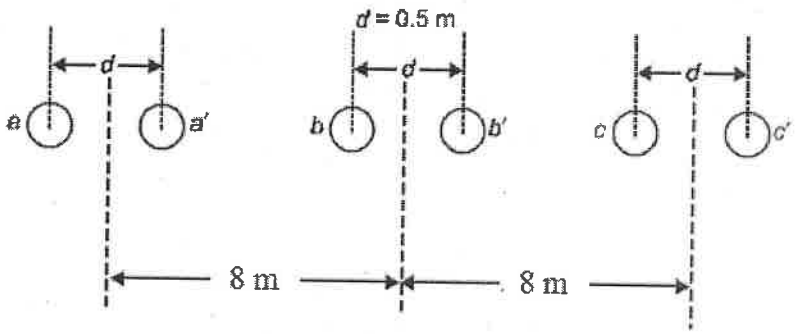
Each question carries TWO marks. **10x2=20M**

1. What is the need of double circuit transmission line? 2 M
2. What are the advantages of bundled conductor? 2 M
3. Define the wave length and velocity of propagation. 2 M
4. What is meant by surge impedance and SIL of long lines? 2 M
5. How the switching transients are severe in the power system? 2 M
6. What is meant by Ferranti effect? 2 M
7. What is the importance of static shielding provided on transmission? 2 M
8. What are the various factors that are affecting the sag in the transmission lines? 2 M
9. Why the capacitance of an underground cable is very high than the capacitance of the overhead lines? 2 M
10. Why armouring is not done in single core cables? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). A bundled conductor has two sub-conductors which are configured for a three-phase line as shown in the below figure. Compute inductive reactance per phase of this line at 50 Hz. Assume that radius of each sub-conductor is 30 mm and line is fully transposed. 10M



OR

11. B). Derive the expression for capacitance of three phase transposed line. 10M

12. A). Derive the mathematical modelling of medium transmission line using nominal T method. 10M

OR

12. B). A long transmission line delivers a load of 60 MVA at 132 kV, 50 Hz at 0.8 p.f lagging. Resistance of the line is 25.3 Ω, reactance is 66.5 Ω and its admittance due to line charging is $0.445 \times 10^{-3} mho$. (i) Find sending end voltage by rigorous solution (ii) regulation at no load and full load. 10M

(P.T.O..)

13. A). Derive the expression for transmitted and reflected voltages at the capacitive junction due to transients? Draw the voltage and current waves if the line is terminated with a capacitance. 10M

OR

13. B). Explain various factors affecting corona. 10M

14. A). Explain the effect of ice loading and wind pressure on sag of a transmission line? 10M

OR

14. B). The self-capacitance of each unit in a string of three suspension insulation is C. The shunting capacitance of the connecting metal work of each insulator to earth is 0.15C while for line it is 0.1C. Calculate (i) The voltage across each insulator as a percentage of the line voltage to earth and (ii) string efficiency. 10M

15. A). With neat diagram explain the constructional features of various types of cables. 10M

OR

15. B). Define grading of a cable. The capacitances of a 3-phase belted cable are 12.6μF between the three cores bunched together and the lead sheath and 7.4μF between one core and the other two connected to sheath. Find the charging current drawn by the cable when connected to 66kV, 50Hz, star connected supply. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30209**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Control Systems

(Electrical & Electronics Engineering)

Date: 26.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. List out the examples of open loop systems. 2 M
2. Write Masson's gain formulae. 2 M
3. Define rise time and peak time? 2 M
4. Define steady state error? 2 M
5. What is relative stability? 2 M
6. Define gain margin and phase margin. 2 M
7. $G(s) = \frac{1}{(S-2)(S-5)}$ what is the number of encirclements required for the given closed loop system to be stable. 2 M
8. List the advantages of PID Controller. 2 M
9. What are the properties of State transition matrix? 2 M
10. When do you say that the system is completely observable? 2 M

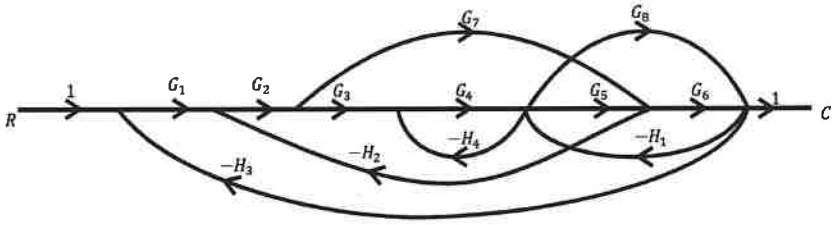
PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Briefly explain the effect of feedback on system parameters gain, sensitivity, stability and time constant. 10M

OR

11. B). Determine the overall gain of the system using Masson's gain formulae. 10M



12. A). Derive the expression for time response of second order under damped system for unit step input and also draw the response curve. 10M

OR

12. B). The open loop transfer function of a unity feedback system is $G(s) = \frac{10}{s(s+4)}$. Determine the nature of response of the closed loop system for a unit step input. Also determine the rise time, peak time, peak overshoot and settling time. 10M

(P.T.O..)

13. A). The open loop transfer function of a unity feedback system is given by is G(s) $=\frac{K(S+9)}{S(S^2+4S+11)}$. Sketch the root locus and find the limiting value of K for the system stability. 10M

OR

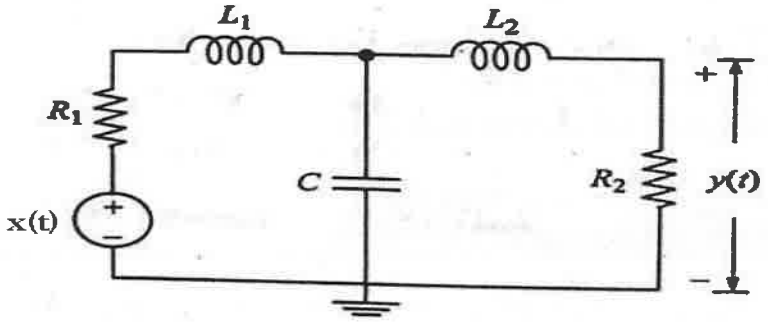
13. B). Draw the Bode plot for the transfer function G(s)= $\frac{16(1+0.5S)}{s^2(1+0.125S)(1+0.1S)}$ From graph Determine i) Gain cross over frequency ii) Phase cross over frequency iii) G.M and P.M iv) Stability of the system. 10M

14. A). Sketch the Nyquist plot and comment on the stability of the closed loop system, Whose open loop transfer function is G(s)H(s)= $\frac{K(S-4)}{(S+1)^2}$. 10M

OR

14. B). The open loop transfer function of a unity feedback system is G(s) $=\frac{K}{S(S+1)(1+0.1s)}$. Design a phase lag compensator to meet the following specifications. (i) Velocity error constant K_v=10 (ii) Phase margin =35^0. Also compare the cross over frequencies of the un compensated and compensated systems. 10M

15. A). Obtain the state model and draw the state diagram for the given simple electrical system. 10M



OR

15. B). Examine the complete state controllability and observability for the system described as 10M

$$\begin{bmatrix} \dot{X}1 \\ \dot{X}2 \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} X1 \\ X2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$$

$$Y = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} X1 \\ X2 \end{bmatrix}$$

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30212**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Power System Protection

(Electrical & Electronics Engineering)

Date: 28.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	What is Resistance Switching?	2 M
2.	State the principle of Arc extinction.	2 M
3.	What is meant by MHO relay?	2 M
4.	List out the merits of Static relays.	2 M
5.	How do you protect generator against stator faults?	2 M
6.	Mention different types of faults occur in generators.	2 M
7.	What are the functions of grounding in power system?	2 M
8.	What are the advantages of neutral grounding?	2 M
9.	Mention the importance of a lightning arrester.	2 M
10.	List out the causes of over voltages in an electrical system.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the terms recovery voltage, restriking voltage and RRRV. Derive an expression for restriking voltage in terms of system capacitance and inductance.	10M
	OR	
11. B).	Sketch and explain the construction and operation of Air blast circuit breaker.	10M
12. A).	Illustrate the working of induction type directional over current relay with a neat sketch.	10M
	OR	
12. B).	Explain the working of microprocessor based over current relay with suitable diagram.	10M
13. A).	An 11kv,1000 MVA generator is provided with differential scheme of protection. The percentage of generator winding to be protected against phase to ground fault is 80%, the relay is set to be operate when there is a 15% out of balance current determine the value of resistance to be placed in neutral to ground connection?	10M
	OR	
13. B).	i) Discuss the percentage differential protection scheme of a transformer.	5M
	ii) Explain the working principle of buch-holtz relay with neat diagram.	5M
14. A).	Elaborate the effects of Ungrounded neutral on system performance.	10M
	OR	
14. B).	Discuss and compare the various methods of neutral grounding.	10M
15. A).	What are the various types of lighting arresters? Explain, with a neat sketch, the working of Zinc-Oxide lightning arrester.	10M
	OR	
15. B).	i) Enumerate the basic concepts of insulation coordination.	5M
	ii)Write short notes on Basic impulse level and its significance.	5M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30210**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Power Electronics

(Electrical & Electronics Engineering)

Date: 01.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Define latching current and holding current?	2 M
2.	What is the difference between diode and thyristor?	2 M
3.	What is the function of freewheeling diodes in controlled rectifier?	2 M
4.	Define input power factor in controlled rectifier and write its expression.	2 M
5.	What is the equation for average output voltage of single phase full controlled rectifier with RL load in continuous mode.	2 M
6.	What is meant by Duty cycle?	2 M
7.	What kind of commutation is required for step-up cyclo-converter?	2 M
8.	What is the output voltage of step-up chopper where V_s is the source voltage and α as the duty cycle?	2 M
9.	What is sinusoidal PWM technique?	2 M
10.	What are the limitations of a cycloconverter compared ac voltage controller.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Discuss different modes of operation of thyristors with the help of static VI characteristics.	10M
	OR	
11. B).	Explain the switching characteristics of an IGBT, why are IGBTs becoming popular in their applications to controlled converters?	10M
12. A).	A single -phase full converter has a RL load having L = 6.5 mH, R = 0.5 Ω and E = 10 V. The input voltage is Vs = 120 V at (r.m.s) 60 Hz. Determine: (i) The average thyristor current Ia. (ii) r.m.s thyristor current I_R. (iii) The average output current I_{dc}.	10M
	OR	
12. B).	Explain the working principle of Single-phase Dual Converter using thyristor with both circulating non circulating modes of operation and write its applications.	10M
13. A).	i) Discuss the main classification of dc-to-dc thyristor converters. Which of these is more commonly employed why?	5M
	ii) Describe the principle of buck converter, derive an expression for its average dc output voltage.	5M
	OR	
13. B).	With neat sketch draw the circuit diagram for buck boost converter and obtain the relation between duty ratio and average output voltage.	10M

(P.T.O..)

14. A). Discuss the principle of working a three-phase bridge inverter with an appropriate circuit diagram. Draw phase and line voltage waveforms on assumptions of each thyristor conducts for 180^0 and R load is star connected. The sequence of firing of various SCRs should also be indicated in the diagram. 10M

OR

14. B). What is pulse width? List the various PWM Techniques. How do these differ from each other. 10M

15. A). i) What is an AC Voltage controller? List some of its industrial applications. Enumerates its merits and demerits. 5M

ii) Describe the single-phase AC voltage controllers with both R and RL loads for discontinues mode of operation. 5M

OR

15. B). Describe the basic principle of working of single phase to single phase step down cycloconverter for both continuous and discontinuous conduction for a bridge type cycloconverter. Mark the conduction of various thyristors also. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30213**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Electrical Measurements

(Electrical & Electronics Engineering)

Date: 03.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. List the precautions that need to be taken during the usage of potentiometers. 2 M
2. Mention one advantage and disadvantage of A.C potentiometers. 2 M
3. Why is the voltmeter-ammeter method unsuitable for the precise measurement of low resistance? 2 M
4. Explain the working principle of Wheatstone's bridge. 2 M
5. State the applications of a Wein bridge. 2 M
6. Name two bridges used to measure capacitance. 2 M
7. Explain how a Maxwell Bridge is used for iron loss measurement. 2 M
8. Explain "charge is proportional to first swing of the moving coil". 2 M
9. State difference between analog and digital instrument. 2 M
10. Explain working of clamp-on-meter. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Derive an expression for the force of attraction between the plates in a parallel plate electrostatic voltmeter. 10M

OR

11. B). Explain the working of DC Crompton potentiometer with a neat circuit diagram 10M

12. A). Explain kelvin's double bridge for measurement of low resistance with neat circuit and phasor diagram. 10M

OR

12. B). Explain measurement of unknown resistance and derive the balance conditions with Wheatstone's bridge and state its limitations. 10M

13. A). Sketch the circuit diagram of Anderson's bridge. Derive the equations for resistive and inductive components of the inductor to be measured. 10M

OR

13. B). Explain Maxwell's inductance bridge for the measurement of inductance. 10M

(P.T.O.)

14. A). The measured values of iron loss of a magnetic specimen of weight 15 kg are 19.8 W and 30 W at 40 Hz and 60 Hz respectively at a constant peak value flux density. Determine the values of hysteresis and eddy current losses in W/Kg at 50 Hz for the same value of flux density. 10M

OR

14. B). Explain how hysteresis loop is determined by method of reversals with a neat connection diagram. 10M

15. A). Explain the functioning of a successive approximation type digital voltmeter. 10M

OR

15. B). Explain the principle and working of DSO with a neat block diagram? 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30331**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Dynamics of Machinery

(Mechanical Engineering)

Date: 24.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Define the terms static force analysis and dynamic force analysis. 2 M
2. Why there is no effect of the gyroscopic couple acting on the body of a ship during rolling? 2 M
3. Elaborate any two differences of flywheel and governor. 2 M
4. State the Limitations of Watts Governor. 2 M
5. Write the functions of a clutch. 2 M
6. List out any four different types of brakes. 2 M
7. Why balancing of masses is required in a shaft? 2 M
8. Is complete balancing is possible in reciprocating masses? why? 2 M
9. What do you mean by transmissibility in vibration? 2 M
10. Formulate a relation for natural frequency of a cantilever beam. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain the effect of the gyroscopic couple and derive the expression on the reaction of the four wheels of a vehicle negotiating a curve. 10M

OR

11. B). If the crank and the connecting rod are 400 mm and 1200 mm long, respectively, and the crank rotates at a constant speed of 300 r.p.m., Determine:1. The crank angle at which the acceleration is zero, and 2. Maximum velocity of the piston. 10M

12. A). The turning moment diagram for a multicylinder engine has been drawn to a scale 1 mm=600 N-m vertically and 1 mm=30^0 horizontally. the intercepted areas between the output torque curve and the mean resistance line, taken in order from one end as follows: +52, -124, +92, -140, +85, -72 and +107 mm^2, when the engine is running at a speed of 600 r.p.m. If the total fluctuation of speed is not to exceed ± 1.5 % of the mean, find the necessary mass of the flywheel of radius 0.5m. 10M

OR

12. B). A governor of the Proell type has each arm 250 mm long. The pivots of the upper and lower arms are 25 mm from the axis. The central load acting on the sleeve has a mass of 25 kg and the each rotating ball has a mass of 3.2 kg. When the governor sleeve is in mid-position, the extension link of the lower arm is vertical and the radius of the path of rotation of the masses is 175 mm. The vertical height of the governor is 200 mm. If the governor speed is 160 r.p.m. when in mid-position, find: 10M

i. Length of the extension link; and

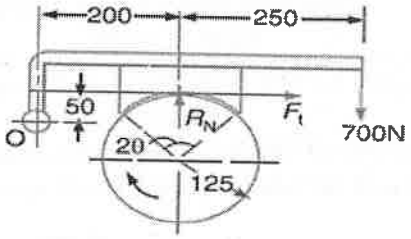
ii. Tension in the upper arm.

(P.T.O..)

13. A). Explain the working of Cone clutch with neat sketch. 10M

OR

13. B). A single block brake is shown in Fig. The diameter of the drum is 250 mm and the angle of contact is 90°. If the operating force of 700 N is applied at the end of a lever and the coefficient of friction between the drum and the lining is 0.35, determine the torque that may be transmitted by the block brake. 10M



All dimensions in mm.

14. A). Four masses A, B, C and D as shown below are to be completely balanced. 10M

	A	B	C	D
Mass (kg)	-	30	50	40
Radius (m)	0.18	0.24	0.12	0.15

The places containing B and C are 0.3 m apart. The angle between planes containing B and C is 90^O. B and C make angles of 210^O and 120^O, respectively with D in the same sense. Determine:

The magnitude of the angular position of mass A, and The positions of A and D.

OR

14. B). An inside cylinder locomotive has its cylinder centre lines 0.7 m apart and has a stroke of 0.6 m. The rotating masses per cylinder are equivalent to 150 kg at the crank pin, and the reciprocating masses per cylinder to 180 kg. The wheel centre lines are 1.5 m apart. The cranks are at right angles. The whole of the rotating and 2/3 of the reciprocating masses are to be balanced by masses placed at a radius of 0.6 m. Find the magnitude and direction of the balancing masses. Find the fluctuation in rail pressure under one wheel at a crank speed of 300 r.p.m. 10M

15. A). A steel shaft 1.5 m long is 95 mm in diameter for the first 0.6 m of its length, 60 mm in diameter for the next 0.5 m of the length and 50 mm diameter for the remaining 0.4 m of its length. The shaft carries two flywheels at two ends, the first having a mass of 900 kg and 0.85 m radius of gyration located at the 95 mm diameter end and the second having a mass of 700 kg and 0.55 m radius of gyration located at the other end. Determine the location of the node and the natural frequency of free torsional vibration of the system. The modulus of rigidity of shaft material can be taken as 80 GN/m^2. 10M

OR

15. B). Discuss Dunkerley's method to find the natural frequency of a shaft carrying several loads. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30332**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Manufacturing Technology

(Mechanical Engineering)

Date: 26.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Mention the specifications of lathe.	2 M
2.	Define the term "machine tool."	2 M
3.	Mention the specifications of drilling machine.	2 M
4.	Differentiate between jig and fixture.	2 M
5.	Compare planning &slotting operations.	2 M
6.	Mention the principal parts of shaping machine	2 M
7.	Difference between up milling and down milling.	2 M
8.	Mention milling machine accessories	2 M
9.	Mention the purpose of a grinding operation.	2 M
10.	Mention different types of bonding in grinding operation.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Sketch and explain the working principle and parts of lathe.	10M
	OR	
11. B).	Sketch the taper turning and thread cutting operations.	10M
12. A).	Sketch and explain the parts of the radial drilling machine.	10M
	OR	
12. B).	Sketch the cutting operations performed by drilling machine.	10M
13. A).	Explain the kinematic system of shaping machine.	10M
	OR	
13. B).	Explain the kinematic system of planning machine.	10M
14. A).	Sketch and explain the horizontal milling machine and discuss method of indexing.	10M
	OR	
14. B).	Explain gear milling and gear broaching operations.	10M
15. A).	With neat sketch explain the constructional features of broaching machine.	10M
	OR	
15. B).	Enumerate the characteristics of a grinding wheel.	10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30334**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Thermal Engineering

(Mechanical Engineering)

Date: 28.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1. State the methods of increasing the thermal efficiency of a Rankine cycle. 2 M
2. Define regeneration process. 2 M
3. Write the equation for condenser efficiency. 2 M
4. Explain critical pressure ratio of steam nozzle. 2 M
5. Explain the impulse turbine with velocity diagram. 2 M
6. Explain the reaction turbine with mechanical details. 2 M
7. Write the operation of combustion chamber in gas turbine. 2 M
8. What do you understand by Ideal cycle of gas turbine? 2 M
9. Define propulsive efficiency of jet propulsion system. 2 M
10. Define thermal efficiency of jet propulsion system. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). What is the effect of reheat on: (i) Specific output (ii) Cycle efficiency (iii) Steam rate (iv) Heat rate. 10M

OR

11. B). Explain the Boiler mountings and accessories. 10M

12. A). Explain about the classification of condensers. 10M

OR

12. B). Derive the equation for mass flow rate through steam nozzle. 10M

13. A). Describe the use of combined velocity triangle of an impulse turbine. 10M

OR

13. B). A stage of steam turbine with Parson blading delivers dry, saturated steam at 2.7 bar from the fixed blades at 90 m/s. The mean blade height is 40 mm and the moving blades exit angle is 20^0. The axial velocity of steam is three quarter of the blade velocity at the mean radius. The steam is supplied to the stage at the rate of 9000 kg/h. The effect of the blade tip thickness on the annulus area can be neglected. Calculate: (i) The rotational speed of the wheel. (ii) The diagram power. (iii) The diagram efficiency. (iv) The enthalpy drop of the steam in this stage. 10M

14. A). Briefly explain about Reheat cycle gas turbine with neat sketch. 10M

OR

14. B). Derive the efficiency of a simple gas turbine. 10M

15. A). Derive the equation for thrust and thrust power in jet propulsion. 10M

OR

15. B). What are the field applications of rocket engines? 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30335

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Machine Design

(Mechanical Engineering)

Date: 01.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. What are the various manufacturing considerations used in designing of machine component. 2 M
2. What are important mechanical properties of materials used in design? 2 M
3. Why riveted joints are preferred over welded joints in aircraft body? 2 M
4. What types of riveted joints are used for boiler joints? 2 M
5. Distinguish the term 'Design for strength' and 'Design for rigidity' in a shaft Design. 2 M
6. Shafts are always of uniform circular cross section. True or false. Justify. 2 M
7. Define hydrostatic lubrication. 2 M
8. What is journal bearing? List any two applications. 2 M
9. Define spring rate and spring Index of a helical spring. 2 M
10. Why camber is provided in leaf spring? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) List the important factors that influence the magnitude of factor of safety. 5M

ii) What are the different types of loads that can act on machine components? 5M

OR

11. B). i) What are the general procedure involved in machine design? 5M

ii) What are the factors that govern selection of materials while designing a machine component? 5M

12. A). i) A plate 100 mm wide and 10 mm thick is to be welded to another plate by means of double parallel fillets. The plates are subjected to a static load of 80 kN. Find the length of weld if the permissible shear stress in the weld does not exceed 55 MP? 5M

ii) What are the common materials used in mechanical engineering design? 5M

OR

12. B). A mild steel cover plate is to be designed for an inspection hole in the shell of a pressure vessel. The hole is 120 mm in diameter and the pressure inside the vessel is 6 N/mm2 . Design the cover plate along with the bolts. Assume allowable tensile stress for mild steel as 60 MPa and for bolt material as 40 MPa. 10M

(P.T.O..)

13. A). A shaft is required to transmit 16 KW at 500 rpm. Select a suitable key of rectangular cross section, if the hub length 60 mm. Take allowable shear and crushing stresses for material used as 72 MPa and 140 MPa respectively. 10M

OR

13. B). A shaft transmits power 2 KW at 150 rpm from the electric motor head stock of lathe by means of a vertical belt drive. The co-efficient of friction for the belt for the belt is 0.3 and the angle of wrap is 1800. The weight of the pulley is 150N. the shaft material has ultimate stress is 770 N/mm2, yield stress is 560 N/mm2. Kb = Kt = 1.5. Determine the shaft diameter. 10M

14. A). i) Enumerate the detail steps involved in the selection of bearings from the manufacturer's catalogue. 5M

ii) Design a journal bearing for 12 MW, 1000 rpm steam turbine, which is supported by two bearings. Take the atmospheric temperatures as 60°C. Assume viscosity of oil as 23 centistokes. 5M

OR

14. B). Load on a hydrodynamic full journal bearing is 30 kN. The diameter and speed of the shaft are 150 mm and 1200 mm respectively. Diametral clearance 0.2 mm. Sommerfield number is 0.631. L/D ratio 1:1. Calculate temperature rise of oil, quantity of the oil, heat generated and type of oil required. 10M

15. A). Design of helical compression spring to sustain an axial load of 4 kN. The deflection is 80 mm. Spring index is 6. The shear stress is not to exceed 350 MPa. Rigidity modulus for spring material is 81 GPa. 10M

OR

15. B). Design a leaf spring for a truck to the following specifications. Maximum load on the spring = 140KN, number of springs = 4, material of springs is chrome vanadium steel, permissible tensile stress = 600 N/mm 2 Maximum number of leaves = 10, span at spring = 1000mm, permissible deflection = 80mm, young's modulus of the spring = 200KN/mm2. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30414**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Electronic Measurements & Instrumentation

(Electronics & Communication Engineering)

Date: 24.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Define accuracy and sensitivity. 2 M
2. Define the terms in context of normal frequency distribution of data i) Average Deviation, ii) Standard Deviation. 2 M
3. What is meant by Harmonic Distortion? 2 M
4. What is sweep frequency generator? 2 M
5. What is the function of electron gun? 2 M
6. How many cycles of an 8 KHz sinusoidal signal appear on CRO screen if the sweep frequency is 2 KHz? 2 M
7. What is strain gauge? 2 M
8. Compare the transducer and sensor. 2 M
9. List the limitations of Wheatstone bridge. 2 M
10. What is the method for the measurement of Liquid level? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) List out the different types of errors and explain them? 4M

ii) A Volt meter is accurate to 98% of full-scale reading 6M

a) If a voltmeter reads 200V and 500V range. what is the Absolute error?

b) What is the % Error reading of Part-i.

OR

11. B). i) Discuss about D'Arsonval movement. 5M

ii) How do we extended the range of voltage and current meters? 5M

12. A). Explain the operation of Spectrum Analyzer with the help of block diagram and state the application of spectrum analyzer. 10M

OR

12. B). With a neat diagram explain the working of Pulse and Square wave generators. 10M

13. A). i) Discuss about delay lines in CRO. 5M

ii) What is the use of Vertical amplifier in CRO? 5M

OR

13. B). Explain the operation of sampling oscilloscope? Mention its advantages and disadvantages. 10M

(P.T.O..)

14. A). Construct the LVDT and Explain the method of measuring displacement using LVDT. 10M

OR

14. B). i) What is a transducer? Explain the working of Variable Capacitance transducer. 5M

ii) A 100Ω strain gauge with a gauge factor of 1 is affixed to a metal bar. The bar is stretched and this causes a change in resistance of 0.001Ω. Find the change in length if the original length is 10cm. 5M

15. A). Construct the circuit and derive the condition of balance for a Maxwell's bridge. 10M

OR

15. B). What is Data Acquisition system? Explain with block diagram and applications of the data acquisition system. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30411

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Antenna & Wave Propagation

(Electronics & Communication Engineering)

Date: 26.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Define Directivity.	2 M
2.	What are the different types of aperture?	2 M
3.	What is meant by uniform linear array?	2 M
4.	What is Broad side array?	2 M
5.	Explain why an antenna using a parabolic reflector is likely to be highly directive receiving antenna.	2 M
6.	Mention the properties of patch antennas.	2 M
7.	Why Yagi antenna is preferred in television receivers?	2 M
8.	List the applications of Helical Antenna.	2 M
9.	Define Ground Wave.	2 M
10.	In which frequency range Sky wave propagation is useful.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) Explain about loop antenna in detail.	5M
	ii) Explain the terms isotropic source, power gain, directivity and HPBW.	5M
	OR	
11. B).	i) Explain the radiation mechanism in short dipole.	5M
	ii) Explain the following: (a) Main lobes and side lobes (b) Beamwidth.	5M
12. A).	Draw the block diagram of yagi-uda antenna and explain its design procedure.	10M
	OR	
12. B).	i) Explain the operation of helical antenna and give the applications.	5M
	ii) Explain the salient features of horn antenna.	5M
13. A).	Explain the Microstrip Antenna feeding techniques. What are the advantages and limitaions of MSA?	10M
	OR	
13. B).	Classify the lens Antenna? Explain the function of lens antennas.	10M

(P.T.O..)

14. A). Explain various antenna gain measurement techniques. 10M

OR

14. B). Find the array factor and nulls of pattern for a four element array of isotropic sources with spacing of $d=\lambda/4$ along the z axis. The excitation coefficient of even elements is -1 and where as that of odd elements is 1. 10M

15. A). What is M-Curves and explain Duct propagation? 10M

OR

15. B). i) Explain the effect of wave tilt in Ground wave propagation. 5M

ii) Explain the sky wave propagation. 5M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30412**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Linear & Digital IC Applications

(Electronics & Communication Engineering)

Date: 28.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Define Virtual ground property of an Op-Amp.	2 M
2.	What are the important blocks are available in voltage regulators?	2 M
3.	What are the advantages of Active filters?	2 M
4.	Define capture and lock range.	2 M
5.	List direct type and indirect type ADC's.	2 M
6.	Define resolution and settling time.	2 M
7.	Define decoder with block diagram.	2 M
8.	Define Magnitude comparator.	2 M
9.	Draw the truth table of JK flip flop.	2 M
10.	What are types of ROMs & Applications of ROMs?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Describe the operation of Inverting & Non-Inverting Op-Amp configurations with neat sketches.	10M
	OR	
11. B).	Describe the operation of comparator with neat sketches and applications.	10M
12. A).	Design a circuit for generating a square wave using op-amp.	10M
	OR	
12. B).	Describe the operation of monostable multivibrator using IC 555.	10M
13. A).	Explain the R-2R Ladder type DAC with neat diagram.	10M
	OR	
13. B).	Explain the working of successive approximation type ADC.	10M
14. A).	Give the classification of integrated circuits and compare the various logic families.	10M
	OR	
14. B).	Design a 4-bit parallel full adder with look ahead carry scheme.	10M
15. A).	Design a 4-bit serial in parallel out shift register.	10M
	OR	
15. B).	Describe ROM architecture along with types and applications.	10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30413**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Digital Signal Processing

(Electronics & Communication Engineering)

Date: 01.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Define LTI system. 2 M
2. What are the different operations that can be performed on a sequence? 2 M
3. What are the Drawbacks of N-DFT as N increases? 2 M
4. How many number of additions and multiplications are in DFT and FFT? 2 M
5. List the steps in the design of a digital filter from analog filters. 2 M
6. What are the properties of IIR filters? 2 M
7. What are the characteristics of window? 2 M
8. What is Gibb's phenomenon? 2 M
9. List the applications of multi rate signal processing. 2 M
10. Why the limit cycle problem does not exist when FIR digital filter is realized in direct form? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Find the linear, invariance and causality of the system described by the difference equation, $y(n) = x(n) - ax(n - 1)$. 5M

ii) Examine the stability for the system, $h(n) = 5^n u(3-n)$. 5M

OR

11. B). Determine the frequency response and impulse response of a causal LTI system, represented by the constant coefficient difference equation. 10M

$$y[n] - \frac{5}{6}y[n-1] + \frac{1}{6}y[n-2] = \frac{1}{3}x[n-1]$$

12. A). State and prove any two properties of DFT. 10M

OR

12. B). Find DFT of a sequence {1,2,3,4,4,3,2,1} using Radix- 2 DITFFT algorithms. 10M

13. A). Using Bilinear transformation, design a high pass filter, monotonic in pass band with cutoff frequency of 1000 Hz and down 10dB at 350 Hz. The sampling frequency is 5000 Hz. 10M

OR

13. B). For the given specifications design an analog Butterworth filter. 10M

$0.9 \leq |H(e^{j\Omega})| \leq 1 \quad for\ 0 \leq \Omega \leq 0.2\pi$

$|H(e^{j\Omega})| \leq 0.2 \quad for\ 0.4\pi \leq \Omega \leq \pi$

(P.T.O.)

14. A). Design a linear phase FIR filter with the magnitude response 10M

$H(e^{j\Omega}) = 1 \; for \; |\Omega| \leq \pi/4$

$= 0 \; for \; \pi/4 \leq |\Omega| \leq \pi$

Use Rectangular window. The length of the impulse response is limited to 7. Find t magnitude response of designed filter.

OR

14. B). Compare IIR and FIR filters. 10M

15. A). Explain sampling rate conversion by a rational factor I/D in Multirate signal processing with a neat block diagram. 10M

OR

15. B). i) What are the effects of finite word length in digital filters? 5M

ii) Explain limit cycles in recursive structures. 5M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30514

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Computer Networks

(Common for CSE, IT, CSM, CSD & AID)

Date: 24.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1. Write the advantages of optical fiber over twisted-pair and coaxial cables. 2 M
2. What is ARP? 2 M
3. Define piggybacking. 2 M
4. What is Ethernet? 2 M
5. Give the advantages of hierarchical routing. 2 M
6. Write any two services of network layer provides to transport layer. 2 M
7. What is transport protocol? 2 M
8. Compare port and protocol. 2 M
9. What is Resource records? 2 M
10. State multimedia. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Describe the characteristics of layered architecture. 5M
ii) Compare and contrast the OSI and TCP/IP reference model. 5M

OR

11. B). i) Explain at least four main applications of the Internet. 5M
ii) Differentiate radio and microwave transmission in unguided media. 5M

12. A). i) What are the different types of error detection methods? 5M
ii) Explain the CRC error detection technique using generator polynomial x^4+x^3+1 and data 11100011. 5M

OR

12. B). i) Describe dynamic channel allocation in LANs and MANs. 5M
ii) Write about CSMA with collision detection. 5M

13. A). What is a routing algorithm? Explain in detail anyone routing algorithm. 10M

OR

13. B). i) Explain the optimality principle with a suitable example. 5M
ii) Write a note on load shedding. 5M

14. A). Explain the connection establishment and release in transport layer. 10M

OR

14. B). i) Briefly explain the congestion control with leaky bucket algorithm. 5M
ii) Describe the TCP connection management. 5M

(P.T.O..)

15. A). i) Write a detail note on DNS server. 5M

ii) Write any 10 domain names and explain the purpose of each of them. 5M

OR

15. B). Explain about Email with different architecture. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30518**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Formal Languages & Automata Theory

(Computer Science & Engineering)

Date: 26.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Differentiate NFA and DFA. 2 M
2. List and explain the components of finite state automat. 2 M
3. Define Arden's theorem and explain it by taking an example 2 M
4. Write the regular expression to denote a language L which accepts all the strings which ends with 101 over the alphabet $\sum = \{0,1\}$. 2 M
5. Give CFG to generate balanced parenthesis? 2 M
6. Give the formal definition of a PDA. 2 M
7. Stat Pumping Lemma for context free languages. 2 M
8. List the closure properties of context free languages. 2 M
9. Explain about Turing Machine. 2 M
10. Write a short note on Recursive languages. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

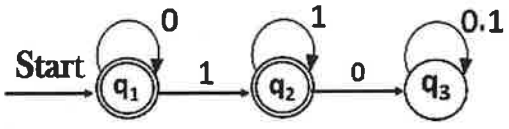
11.A). i) Construct DFA to accept set of all strings ends with ba over alphabet {a,b}. ? 5M

ii) Construct DFA over the alphabet $\sum = \{0,1\}$ to accept the language L={w/w≡ 0 mod 3}. 5M

OR

11. B). Construct Mealy and Moore machines for the following processes: 10M
For input from (0 + 1)*, if the input ends in 101, output A ; if the input ends in 110, output B;Otherwise output C.?

12. A). Construct the regular expression for the given DFA. 10M



OR

12. B). Prove that the following languages are not regular by using pumping lemma. 10M
i) $L = \{a^p \mid \text{where p is a prime}\}$.
ii) $L = \{ a^n b^n \mid n>0 \}$

(P.T.O..)

13. A). Construct PDA generating L= {WCW^R/ W ∈ {a, b}*}, W^R is the reverse of W. 10M

OR

13. B). Convert the following PDA into its equivalent CFG. The transition function is defined as: 10M

$\delta(q0, 0, Z) = \{(q0, 0Z)\}$
$\delta(q0, 0, 0) = \{(q0, 00)\}$
$\delta(q0, 1, 0) = \{(q1, \varepsilon)\}$
$\delta(q1, 1, 0) = \{(q1, \varepsilon)\}$
$\delta(q1, \varepsilon, Z) = \{(q2, \varepsilon)\}$

14. A). i) Convert the given CFG to CNF 5M

$S \rightarrow a \mid aA \mid B$

$A \rightarrow aBB \mid \varepsilon$

$B \rightarrow Aa \mid b$

ii) Let G be S→AB, A→a, B→C/b,C→D,D→E and E→a 5M
Eliminate unit productions and get an equivalent grammar.

OR

14. B). i) Convert the grammar into GNF 5M
S→ABb|a, A→aaA| B, B→bAb
ii) Show that the following is not context-free language. 5M
$L=\{a^i b^j c^k \mid i < j < k\}$

15. A). i) Design TM which will recognize strings containing equal number of 0's and 1's. 5M
ii) Design TM that accepts the language 00*. 5M

OR

15. B). i) Discuss about universal Turing Machine. 5M
ii) Define post's correspondence problem and show that it is undecidable. 5M

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H.T No: | | | | | | | | | | | R18 | Course Code: A30516

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Operating Systems

(Common for CSE & IT)

Date: 01.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Discuss batch Operating systems. 2 M
2. List any four types of system calls. 2 M
3. Define process. What is the information maintained in a PCB? 2 M
4. Distinguish between preemptive and non-preemptive scheduling techniques. 2 M
5. Explain safe state and unsafe state. 2 M
6. Define semaphores. 2 M
7. Define swapping. 2 M
8. Explain the basic approach of page replacement. 2 M
9. Define Free space management. 2 M
10. List any four common file types and their extensions. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain the structures of Operating system with a neat diagram. 10M

OR

11. B). Explain how operating system services are provided by system calls. 10M

12. A). Consider the following set of processes, with the length of the CPU burst given in milliseconds: 10M

Process	Burst- Time	Priority
P1	27	5
P2	12	1
P3	37	2
P4	19	4
P5	10	3

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0. Draw the Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF and Priority. Also determine the average waiting time and average turnaround time for each of the algorithms.

OR

12. B). Describe the differences among long-term scheduling, short-term and medium-term scheduling. 10M

(P.T.O..)

13. A). Explain Banker's algorithm for deadlock avoidance with an example. 10M

OR

13. B). Describe the following IPC mechanisms 10M
i) Shared Memory ii) Message Queues.

14. A). Define paging? Explain Page Structure and Translation Look Aside Buffer. 10M

OR

14. B). Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. 10M
Assume there are three Frames which are initially empty. Using optimal page replacement algorithm determines the number of page faults for the reference string above.

15. A). List the different File allocation method and explain in detail with an example. 10M

OR

15. B). Explain different File access methods with an example. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30530**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Artificial Intelligence

(Common for CSE & IT)

Date: 03.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Define Artificial Intelligence. And List down few applications of A.I.	2 M
2.	What are the different types of agents?	2 M
3.	Define constraint satisfaction problem.	2 M
4.	What is propositional logic?	2 M
5.	What is ontological engineering?	2 M
6.	How Knowledge is represented?	2 M
7.	Define planning.	2 M
8.	What are the components of a planning system?	2 M
9.	Define Baye's theorem.	2 M
10.	Briefly explain about components of learning system.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain informed search strategies with an example. 10M

OR

11. B). There are two jugs, a 5-Liters (5-L) and other 3-Liters (3-L) with no measuring marker on them. There is endless supply of water through tap. The task is to get 4-Liters of water in the 5-Liters jug. Describe the state space and production rules and find the solution path. 10M

12. A). Give algorithm for propositional resolution and Unification algorithm. 10M

OR

12. B). Discuss constraint satisfaction problem with an algorithm for solving a Cryptarithmetic problem. 10M

13. A). Convert the following into FOL and use resolution to prove the conclusion. 10M

i) Anyone whom Mary loves is a football star.

ii) Any student who does not pass does not play.

iii) John is a student.

iv) Any student who does not play is not a football star. (Conclusion) If John does not study, then Mary does not love John

OR

13. B). Write short notes on Backward Chaining and explain with example. 10M

(P.T.O..)

14. A). Explain about Hierarchical planning method with example. 10M

OR

14. B). How to define the planning acting in non-deterministic domain? 10M

15. A). Explain about decision tree learning or ID3 algorithm. 10M

OR

15. B). Construct a Bayesian Network and define the necessary CPTs for the given scenario. We have a bag of three biased coins a,b and c with probabilities of coming up heads of 20%, 60% and 80% respectively. One coin is drawn randomly from the bag (with equal likelihood of drawing each of the three coins) and then the coin is flipped three times to generate the outcomes X1, X2 and X3. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A31201**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Automata & Compiler Design

(Common for IT & CSC)

Date: 26.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	What is language translator?	2 M
2.	How will you define a Context free grammar?	2 M
3.	Explain about handle pruning.	2 M
4.	List down the conflicts during shift-reduce parsing.	2 M
5.	Classify, the two rules for type checking.	2 M
6.	Define type-2 grammars.	2 M
7.	What are the limitations of static allocation?	2 M
8.	Explain about basic blocks.	2 M
9.	Explain principle uses of registers in code generator.	2 M
10.	Explain the following terms: a) Register Descriptor b) Address Descriptor.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) Obtain the Regular Expression represented by the following Regular Set: {0, 1, 00, 01, 000, 001, 0000, 0001, ...}.	5M
	ii) Design a DFA that accepts the language over = {a, b} of all strings that contain the sub-string either aa or bb.	5M
	OR	
11. B).	i) If G is a grammar S->SbS / a, Show that G is ambiguous.	5M
	ii) Design CFG for the language {0n 1 n | n >= 1}	5M
12. A).	What is Bottom Up Parsing?show the Stack implementation of Shift Reduce Parser for the input=(id*id)+id E→E+T|T T→T*F|F F→(E)|id	10M
	OR	
12. B).	Construct the SDD and SDT for desktop calculator.	10M
13. A).	Explain the Chomsky hierarchy for the Languages	10M
	OR	
13. B).	What is Type System? Discuss static and dynamic Checking of types?	10M
14. A).	Explain the different storage allocation strategies.	10M
	OR	
14. B).	Explain the principle sources of optimization in detail.	10M
15. A).	Distinguish machine dependent and machine independent optimization.	10M
	OR	
15. B).	Explain an algorithm for building a DAG from a basic Block.	10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A36205**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Cryptography & Network Security

(CSC)

Date: 24.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Define relatively prime number and write an example. 2 M
2. Evaluate 3^{31} mod 7. 2 M
3. What are the drawbacks of DES algorithm? 2 M
4. Distinguish between Cryptography and Stenography. 2 M
5. Explain the ingredients of public key cryptography. 2 M
6. Define hash function and list out hash algorithms. 2 M
7. Define digital signature. 2 M
8. List out different key distribution techniques. 2 M
9. Distinguish between transport mode and tunnel mode. 2 M
10. What is the need for SPI in IPSec? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain different categories of security attacks. 10M

OR

11. B). Describe the Chinese remainder theorem. 10M

12. A). Describe the block cipher modes of operation with their advantages and disadvantages. 10M

OR

12. B). Explain AES structure and transformation functions. 10M

13. A). Explain the step wise procedure of SHA. 10M

OR

13. B). Explain RSA algorithm and evaluate d and c for given p=3, q=11, e=7 and M=5. 10M

14. A). Explain X.509 certification format of version 3. 10M

OR

14. B). i) Describe the Schnorr digital signature scheme. 5M
ii) Describe simple dialogue of kerberos for providing authentication. 5M

15. A). Explain the operational description of pretty good privacy. 10M

OR

15. B). i) Explain about SSL record protocol. 5M
ii) Explain any one case of basic combinations of security associations. 5M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A36209**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Intrusion Detection & Prevention Systems

(CSC)

Date: 01.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Define Clustering with example.	2 M
2.	Write different types of Attacks.	2 M
3.	Outline types of Intrusions.	2 M
4.	Define Cooperative Intrusion.	2 M
5.	Define Intrusion Detection Security.	2 M
6.	What is Quantifying risk?	2 M
7.	What is Snorts Intrusion Detection?	2 M
8.	Write about Tool Selection Process.	2 M
9.	Write about Legal Issues.	2 M
10.	Give Short note on Organizations Standards.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) What is the difference between IPS and IDS?	5M
	ii) Explain about Hybrid Detection.	5M
	OR	
11. B).	Illustrate on Taxonomy of anomaly detection system.	10M
12. A).	Explain about centralized Intrusion Detection Tiered architecture.	10M
	OR	
12. B).	Outline Distributed Intrusion Detection Tiered architecture.	10M
13. A).	Explain about Threat Briefing.	10M
	OR	
13. B).	Explain Return on Investment.	10M
14. A).	Outline Bro Intrusion Detection.	10M
	OR	
14. B).	Explain about NFR Security.	10M
15. A).	Illustrate Law Enforcement.	10M
	OR	
15. B).	Explain about Evidentiary Issues.	10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30523**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Web Technologies

(CSC)

Date: 03.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	List various String Functions in PHP.	2 M
2.	Design a PHP code to swap any two numbers.	2 M
3.	Define image tag with an example.	2 M
4.	Define naming rules in XML.	2 M
5.	What are the Difference between Generic Servlet and HTTPServlet?	2 M
6.	What is Session?	2 M
7.	What are the Beans in jsp page?	2 M
8.	Explain about Scriptlet Tag.	2 M
9.	What is DATE object in JavaScript?	2 M
10.	Define Event. How events are handled in JavaScript.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain database connectivity in PHP with reference to MYSQL.	10M
	OR	
11. B).	How to read data from web form control like Check boxes explain with an example?	10M
12. A).	How can both Internal and External DTDs be used in an XML File? Show with an Example.	10M
	OR	
12. B).	Define Table tag and their attributes with an example.	10M
13. A).	i) What are the advantages of Servlets over CGI? ii) Explain Life Cycle of a Servlet.	5M 5M
	OR	
13. B).	What is JDBC? How to connecting to a database using JDBC?	10M
14. A).	Explain the components of jsp.	10M
	OR	
14. B).	Explain about the getProperty() and setProperty() of beans in jsp.	10M
15. A).	i) What is JavaScript? What are the features of JavaScript? ii) Design A JavaScript to display whether given number is prime or not.	5M 5M
	OR	
15. B).	i) What is the need of scripting languages in web Technologies? ii) Build a JavaScript program to convert temperature from Celsius to Fahrenheit and vice versa.	5M 5M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30525**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Software Engineering

(Common for CSM & AIM)

Date: 26.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	What are the levels of CMMI?	2 M
2.	List and explain layers of software engineering.	2 M
3.	Define interface specification.	2 M
4.	Discuss Requirements management.	2 M
5.	Outline the design model.	2 M
6.	Distinguish sequence and collaboration diagrams.	2 M
7.	Define White-box testing.	2 M
8.	What is validation testing?	2 M
9.	Tell observations on estimation.	2 M
10.	Define the SCM Repository.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain process patterns and process assessment in detail.	10M
	OR	
11. B).	Discuss Agile process models.	10M
12. A).	Discuss Requirements engineering process in detail.	10M
	OR	
12. B).	Elaborate context models with examples.	10M
13. A).	Draw and explain various Architectural design styles and patterns.	10M
	OR	
13. B).	Construct a class diagram for student information system.	10M
14. A).	Discuss various test strategies for conventional software.	10M
	OR	
14. B).	What are the metrics for Testing and Maintenance? Explain.	10M
15. A).	Demonstrate the Project planning process.	10M
	OR	
15. B).	Explain the following (i) Software reviews (ii) The SCM Process	10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A36603**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Artificial Intelligence and Applications

(CSM)

Date: 28.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Distinguish BFS and DFS.	2 M
2.	Why is it called alpha beta pruning?	2 M
3.	State the elements of propositional logic.	2 M
4.	List the types of knowledge in AI.	2 M
5.	What do you mean by bayesian rule?	2 M
6.	Differentiate conditional probability and unconditional probability.	2 M
7.	State the different forms of learning.	2 M
8.	What is analogy in AI?	2 M
9.	What are the different types of language model in NLP?	2 M
10.	List the examples of expert system.	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Discuss different types of agents based on degree of perceived intelligence and capability. 5M

ii) Discuss current trends in Artificial Intelligence. 5M

OR

11. B). Compare uniformed search strategies. Explain how to minimize the total cost using A* algorithm. 10M

12. A). Consider the following sentences: 10M

John like all kinds of food
Apples are food
Chicken is food
Anything anyone eats and isn't killed is food
Bill eats peanuts and still alive
Sue eats everything Bill eats
Translate these sentences into formulae in predicate logic.

OR

12. B). i) What is propositional logic? How knowledge is represented by propositional logic. 5M

ii) Construct semantic net representation for the following 5M

Mary gave the green flowered vase to her favorite cousin.

(P.T.O..)

13. A). Describe in detail about Dempster -Shafer theory. 10M

OR

13. B). What is probabilistic reasoning? How probability can be determined with uncertain knowledge? Discuss. 10M

14. A). Express your views about rote learning. 10M

OR

14. B). Discuss the different phases of explanation based learning. 10M

15. A). What is Expert System? Explain its architecture, features & applications in brief. 10M

OR

15. B). Discuss the difficulties in developing expert systems. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A36606**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Computer Vision

(CSM)

Date: 01.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Explicate how do you build a computer vision system.	2 M
2.	Justify how an image can be reconstructed from a series of projections?	2 M
3.	Define about neighbors of a pixel.	2 M
4.	Compare RGB color model and CMY color model.	2 M
5.	Write about Thinning and Skeletons.	2 M
6.	What is a threshold value? In how many ways we can set the value?	2 M
7.	Illustrate Mean-shift tracking.	2 M
8.	What is Texture Descriptor?	2 M
9.	List the algorithms which are used in Face detection.	2 M
10.	Define dataset? How can we recognize large datasets?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Discuss goals of Computer vision and Image processing.	10M
	OR	
11. B).	Explain Camera calibration with an example.	10M
12. A).	Briefly explain the following: i) Spatial filtering ii) Frequency domain filtering	10M
	OR	
12. B).	Define Histogram? Explain Histogram equalization with example.	10M
13. A).	Explain with examples morphological operations dilation and erosion.	10M
	OR	
13. B).	Illustrate Region growing algorithm with suitable example.	10M
14. A).	Define Feature extraction and Demonstrate Localized feature extraction.	10M
	OR	
14. B).	Describe Hough Transformation.	10M
15. A).	Demonstrate Adaboost approaches in object modeling & Detection.	10M
	OR	
15. B).	Discuss physical rehabilitation and Training in object modeling.	10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A36605**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Theory of Computation

(CSM)

Date: 10.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Define Finite Automata.	2 M
2.	What are the fundamental concepts of strings and alphabet? How are they defined within the context of formal languages and automata theory?	2 M
3.	Describe Closure Properties of Regular sets.	2 M
4.	What is meant by pumping lemma?	2 M
5.	Define Ambiguity in CFG with example.	2 M
6.	What is a parse tree?	2 M
7.	What is CNF?	2 M
8.	Explain the concept of the pumping lemma for context-free grammars (CFG) in formal language theory.	2 M
9.	What is a Turing machine?	2 M
10.	What is undesirability in automata?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) Construct NFA with ε which accepts a language consisting the strings of any no. of 0's followed by any no. of 1's followed by any no. of 2's. And also convert into NFA without ε.	5M
	ii) Construct a DFA for the language over {0, 1}* such that it contains "000" as a substring.	5M
	OR	
11. B).	i) Draw a Non-deterministic finite automata to accept strings containing the substring 0101	5M
	ii) Construct NFA with ε transition for the following expression 0* + 11	5M
12. A).	How does the process of minimization in Finite State Machines (FSMs) work. Explain with suitable Example.	10M
	OR	
12. B).	Provide an example of a regular language and demonstrate how the Pumping Lemma can be applied to show that it is indeed a regular language.	10M
13. A).	i) Design Push Down Automata for $L = \{a^{2n} b^n \mid n \geq 1\}$	5M
	ii) Construct the equivalent grammar for the PDA M=({q0,q1}, {0,1}, {R,Z0}, δ, q0, Z0, Φ) and δ is given by δ(q0,0,Z0)=(q0,RZ0) δ(q0,0,R)=(q0,RR) δ(q0,1,R)=(q1,R) δ(q1,1,R)=(q1,R) δ(q1,0,R)=(q1,ε) δ(q1,ε,Z0)=(q1,ε)	5M

(P.T.O..)

OR

13. B). i) Define Context free grammar and write context free grammar for the language $L=\{a^i b^j c^k \mid i+j=k, i\geq 0, j\geq 0\}$ 5M

ii) Define ambiguous Grammar. Prove that the following grammar is Ambiguous. 5M
$S\rightarrow aS|aSbS|\varepsilon$

14. A). i) Eliminate Null, unit and useless production from the following grammar 5M
$S\rightarrow AaA|CA|BaB$
$A\rightarrow aaBa|CDA|aa|DC$
$B\rightarrow bB|bAB|bb|aS$
$C\rightarrow Ca|bC|D$
$D\rightarrow bD|\varepsilon$

ii) Convert the following grammar to Greibach Normal Form 5M
$S\rightarrow ABA \mid AB \mid BA \mid AA \mid B$
$A\rightarrow aA \mid a$
$B\rightarrow bB \mid b$

OR

14. B). Convert the following CFG to CNF 10M
$S\rightarrow ASB|\varepsilon$
$A\rightarrow aAS|a$
$B\rightarrow SbS|A|bb$

15. A). Construct a Turing machine that computes the factorial of a given non-negative integer input. Explain the algorithm used, including state transitions and tape modifications. 10M

OR

15. B). i) Design a TM to recognize the language $L=\{ 0^n 1^n 0^n \mid n\geq 1 \}$ 5M

ii) What are undecidable problems? Explain with example. 5M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A36704**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Data Science with R

(CSD)

Date: 28.06.2024 FN | **Time: 3 hours** | **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	What is the purpose of datafication?	2 M
2.	What is Data Science?	2 M
3.	Define different types of Attributes.	2 M
4.	Define Discrete attributes.	2 M
5.	Define Data Frame.	2 M
6.	Define Transpose of a matrix.	2 M
7.	List out some built-in functions.	2 M
8.	What are the logical operators in R	2 M
9.	Define Data Visualization	2 M
10.	What is Wavelet Transforms?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Describes the over fitting and under fitting models with example.	10M
	OR	
11. B).	i) Explain probability distribution with example.	5M
	ii) Difference between Big data and Data science.	5M
12. A).	i) Explain Graphic Displays of Data with example.	5M
	ii) Illustrate in detail the data types of R.	5M
	OR	
12. B).	Explain measuring the central tendency using Mean, Median and Mode.	10M
13. A).	Show how to code R program to create a Data frame which contain details of 5 employees and display the details.	10M
	OR	
13. B).	Explain How accessing List elements with example.	10M
14. A).	Explain the Conditional Statements with example.	10M
	OR	
14. B).	Explain the types of loops in R programming with example.	10M
15. A).	Explain how to Calculate Log-Linear Regression with suitable example in R.	10M
	OR	
15. B).	Explain the complex data visualization.	10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A36705

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Data Mining

(CSD)

Date: 01.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1.	List the types of Data.	2 M
2.	Define Classification.	2 M
3.	Define correlation analysis in data mining.	2 M
4.	What is Constraint-based association mining?	2 M
5.	Define Decision Tree.	2 M
6.	What is a Lazy learner in Data Mining?	2 M
7.	What is the significance of Cluster Analysis in Data Mining?	2 M
8.	Define Outlier Analysis.	2 M
9.	Define Multimedia Data Mining.	2 M
10.	What is Time series data?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the major functionalities of data mining and how they contribute to knowledge discovery.	10M
	OR	
11. B).	Describe the data pre-processing stage in data mining.	10M
12. A).	Explain the concept of association rule mining and its significance in data mining with an example	10M
	OR	
12. B).	What is sequential pattern mining (SPM)? Describe the process of mining sequential patterns and the applications of SPM in real-world scenarios.	10M
13. A).	Explain the principles of Bayesian inference and how they are applied to classify data.	10M
	OR	
13. B).	Explain the concepts of classification and prediction in data mining. Discuss their significance and applications.	10M
14. A).	Discuss the challenges and considerations associated with clustering different data types.	10M
	OR	
14. B).	Differentiate between DBSCAN and K-means and explain DBSCAN with an example.	10M
15. A).	Discuss the challenges and techniques involved in mining continuous, high-volume data streams.	10M
	OR	
15. B).	Explain web mining techniques, including web content mining, web structure mining, and web usage mining.	10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A37201**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Finite Automata & Compiler Design

(AID)

Date: 26.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Classify the two types of Finite Automata. 2 M
2. Find the language generated by the following grammar: 2 M
   S → aSb | ab
3. Check whether the given grammar G is ambiguous or not for the string w= id + id – id 2 M
   E → E+E
   E → E-E
   E → id
4. Differentiate between S-attributed and L-attributed grammars. 2 M
5. Define type conversion with an example. 2 M
6. Compare function overloading and operator overloading 2 M
7. Mention the fields in an Activation record 2 M
8. List the characteristics of peephole optimization. 2 M
9. Define Dead-code elimination. Give an example. 2 M
10. Construct a DAG for the expression: 2 M
    a = b * -c + b *-c

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Write the steps for minimization of DFA and explain with an example. 10M

OR

11. B). Construct a predictive parsing table for the following grammar: 10M
   S → iEtS | iEtSeS | a
   E → b

12. A). Construct a LALR parsing table for the following grammar 10M
   S → CC
   C → cC
   C→ d

OR

12. B). Translate the expression S= -z / a * (x + y) into 10M
   i) 3-address code
   ii) Quadruples
   iii) Triples
   iv) Indirect Triples

(P.T.O..)

13. A). Compare the Chomsky hierarchy of languages and recognizers with examples. 10M

OR

13. B). Examine the need for type checking and equivalence of type expressions with examples. 10M

14. A). Compare the different types of storage allocation strategies with examples. 10M

OR

14. B). Illustrate the construction of basic blocks from a 3-address code and flow graph construction for it with an example. 10M

15. A). Identify and examine the various issues in the design of a code generator. 10M

OR

15. B). Analyze the various algorithms used for generating code from DAG with examples. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: A36601

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Machine Learning

(Common for AID & AIM)

Date: 28.06.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. What is Machine Learning? 2 M
2. What is regression? 2 M
3. Write about maximum likelihood estimation. 2 M
4. What is Bias and variance? 2 M
5. Define clustering. 2 M
6. What is the need of dimensionality reduction? 2 M
7. What is decision tree? 2 M
8. What is information gain? 2 M
9. Brief about perceptron. 2 M
10. What is bagging? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). List and explain various applications of machine Learning. 10M

OR

11. B). Describe various dimensions of supervised machine learning algorithm. 10M

12. A). Explain about Bayesian classification algorithm with suitable example. 10M

OR

12. B). Explain about KNN algorithm. 10M

13. A). Explain about Principal Component Analysis in dimensionality reduction. 10M

OR

13. B). Describe hierarchical clustering with suitable example. 10M

14. A). Compare and contrast Univariate trees and Multivariate trees. 10M

OR

14. B). Explain about Linear discrimination techniques that are used in the decision trees. 10M

15. A). What is multilayer perceptron? Explain the procedure for training the perceptron. 10M

OR

15. B). i) Write differences between Bagging and Boosting. 5M

ii) Explain the training of a Boosting Algorithm for classification problem. 5M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A36714**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Supplementary Examinations June/July-2024

Course Name: Predictive Analytics

(AID)

Date: 01.07.2024 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1. Give few examples of statistical learning problems. 2 M
2. Define Linear Regression. 2 M
3. Define Bias and Variance. 2 M
4. How can we apply the bootstrap to estimate prediction error? 2 M
5. Write short notes on Additive Models. 2 M
6. Give examples for Additive Logistic Regression. 2 M
7. List issues in training Neural Networks. 2 M
8. Define reproducing kernals. 2 M
9. Define Random Forests. 2 M
10. Define Agglomerative Clustering. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Write short notes on (i) Logistic Regression (ii) Linear discriminant analysis. 10M

OR

11. B). Write short notes on Forward and Backward stepwise regression. 10M

12. A). Explain The Bias–Variance trade off with a suitable example. 10M

OR

12. B). Write Boot strap methods with example. 10M

13. A). Explain with an example of spam data using different loss functions. 10M

OR

13. B). Explain with an example of New Zealand Fish using different loss functions. 10M

14. A). Compute SVM for Classification and as a Penalization Method. 10M

OR

14. B). Explain k-Nearest-Neighbors and Image Scene Classification example in detail. 10M

15. A). Explain about Principal component analysis. 10M

OR

15. B). Fit a series of random-forest classifiers to the spam data, to explore the sensitivity to the parameter m. Plot both the OOB error as well as the test error against a suitably chosen range of values for m. 10M

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