Code No. 5165 / S

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II – Semester (Suppl.) Examination, January 2016

Subject: Water Resources Engineering and Management – I

Time: 3 Hours **Max.Marks: 75**

Note: i) Answer all questions from Part A. Answer any five questions from Part B.
ii) Assume data or unit wherever necessary.

PART – A (25 Marks)

1 What is a recording type of Raingauge? What is its purpose? 2

2 A Canal flowing at a duty of 1000 Ha/ cumec, looses 10% of its water by way of percolation in the first one km of its idle run. What would be the revised duty with which the irrigator has to run canal from chainage 1 km. 3

3 Distinguish between cone of depression, draw down and draw down curve. 3

4 What are the fundamental parameters for which diversion structures are designed? 3

5 What are the functions of irrigation? 3

6 Distinguish between Piping & Exit Gradient. 3

7 What feature prompts location of canal fall in the alignment of a canal? 2

8 What is the criteria for selecting a type of CD work for a canal? 3

9 What is an Isohyet? 3

PART – B (5x10 = 50 Marks)

10 a) Develop ordinates of a unit Hydrograph for the storm given below. Consider uniform base flow of 6 cumecs and the catchment area as 10 sq. km. 5

Hours	6 am	8am	10am	12 noon	2pm	4 pm
Q Cumecs	6	28	110	68	18	6

Draw a free hand diagram of the above hydrograph and the unit hydrograph on the same diagram.

b) Draw a neat sketch of Hydrological Cycle and depict on it, the distinct items relevant to Civil Engineering. Explain how each such item (itemwise) influences the formulation of water resources projects. *5*

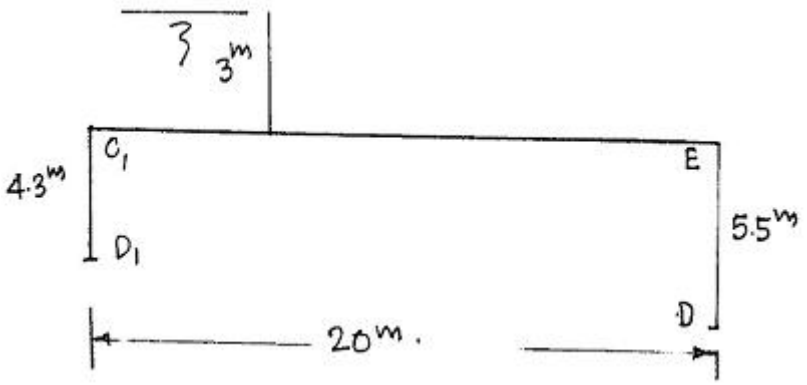
8 a) Explain all the key factors that influence duty in a Canal Irrigated System. 5

b) Derive relation between Duty (D), Delta (Δ) and Base period (B) List the use of such relationship. 5

…2.

9 a) With a relevant diagram, explain the causes of failures of diversion head works. Suggest suitable hydraulic, structural and physical remedies to obviate such failures. 5

b) Using Khosla's method compute pressure at point E and calculate the apron thickness for the diversion work shown below. Take unit weight of apron material as 2.2 T/cum and factor of safety as1.2. 5



10 a) Define Warabandi. Describe the system with a neat sketch duly depicting all tiers of the network and relate each tier with the corresponding water release schedule. How is the equity among users ensured? 5

b) Write short notes on Formulation and Evaluation of Water Resources Projects. 5

11 a) Design number of notches and the size of each notch, for a canal drop with the following data. Assume any missing data. 5

Full supply discharge : 4.5cumecs
Bed width : 7m
FS depth : 1.5 m
Half Supply depth : 1.1m

b) Define Proportionality, Sensitivity, Flexibility of a module. Explain the significance of each. 5

15 a) With the help of a neat sketch, explain design principles of an Aqueduct. State the conditions under which each type of aqueduct is selected. *5*

b) Write brief notes on: 5

i. Integrate water resources management.
ii. Systematic canal operations.

16 a) On a typical Micro irrigation network diagram (drip system) depict all key features and components. Describe the functioning of the entire drip Irrigation system. 5

b) Explain the following

5

i) Different Aquifer parameters and their significance.
ii) Gumbel's method and the steps to be followed in the procedure for forecasting flood in such method. 5

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Code No. 5171 / S

FACULTY OF ENGINEERING

B.E. 3/4 (EE/Inst./ECE) II-Semester (Suppl.) Examination, January 2016

Subject : Managerial Economics and Accountancy

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1 A book which contains "Accounts" is known as (2)
(a) Journal (b) Ledger (c) Cash Book

2 Debit all expenses and Losses and credit all incomes and Profits rule applied for (2)
(a) Personal Account (b) Nominal Account (c) Assets Account

3 IRR relates to : (2)
(a) Capital Budgeting (b) Sales Budgeting (c) Cash Budgeting

4 When there are few sellers the market is : (2)
(a) Oligopoly (b) Monopoly (c) Perfect Competition

5 Iso-Quants are : (2)
(a) Sales curves (b) Cost curves (c) Product curves

6 What are the sources of Monopoly ? (3)

7 Explain about cross demand. (3)

8 What is depreciation and why it is provided? (3)

9 Distinguish between average cost and marginal cost. (3)

10 Why Bank reconciliation statement is prepared? (3)

PART – B (50 Marks)

11 Explain about the structural features of Managerial Economics and how it is useful to engineers.

12 Discuss various types of demand forecasting methods.

13 Explain about the determinants of working capital requirements.

14 Write note on :
(a) Features of Perfect competition
(b) Liquidity ratios

15 (a) Distinguish between Fixed cost and Variable cost.
(b) From the following information calculate:
(i) P/V ratio (ii) BEP (iii) Sales to earn a profit of Rs. 1,20,000
Sales Rs.6,00,000
Variable cost Rs.3,75,000
Fixed cost Rs. 1,80,000

16 A company is in the consideration of two mutually exclusive projects required an initial investment of Rs.2,50,000 each and have a life of 5 years. The discount rate is 10%. The cash inflows after taxes are as follows.

	I-Year	II-Year	III-Year	IV-Year	V-Year
Project-A	Rs.1,50,000	Rs.1,30,000	Rs.1,10,000	Rs.90,000	Rs.70,000
Project-B	Rs.90,000	Rs.90,000	Rs.90,000	Rs.90,000	Rs.90,000

Calculate :
(a) Payback period
(b) Net Present Value
(c) Profitability Index

Judge which project is suitable for Investment.

17 From the following Trial Balance prepare final Accounts of Mr. Krishnan for the year ended 31-12-2011.

Trial Balance as on 31-12-2011

Particulars	Debit (Rs)	Credit (Rs)
Cash at Bank	1,200	-
Purchases	1,20,000	-
Capital		1,00,000
Bills Payable		12,000
Interest received	-	10,000
Opening Stock	35,000	-
Debtors	40,000	-
Freight	10,000	-
Creditors		24,000
Machinery	60,000	-
Furniture	15,000	-
Sales	-	2,01,200
Administrative expenses	20,000	-
Rent	10,000	-
Wages	16,000	-
Salaries	20,000	-
Total	3,47,200	3,47,200

Adjustments:
(i) Closing Stock Rs.15,000
(ii) Outstanding Wages Rs.6,000
(iii) Provide depreciation on Machinery @ 10%

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Code No. 5185 / S

FACULTY OF ENGINEERING

B.E. 3/4 (Mech.) II – Semester (Suppl.) Examination, January 2016

Subject : Control Systems Theory

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (10 x 2.5 = 25 Marks)

1 Compare open loop and closed loop with examples.
2 Define Transfer function and mention its limitations.
3 Find inverse Laplace Transform of $F(s) = \frac{1+0.866s}{\left(s^2+12s+07\right)}$.
4 Find the transfer function of a second order system that yield a 14.6% overshoot with a settling time of 1.5 second.
5 A feedback control system is given by characteristic equation $F(S) = S^3 + (K+4)S^2 + 6S + 8(k+2) = 0$.
6 Find $e^{At}, if\ A = \begin{bmatrix} 1 & 0 \\ -2 & -5 \end{bmatrix}$.
7 Determine the transfer function for the system represented by Bode Plot given in fig.1.

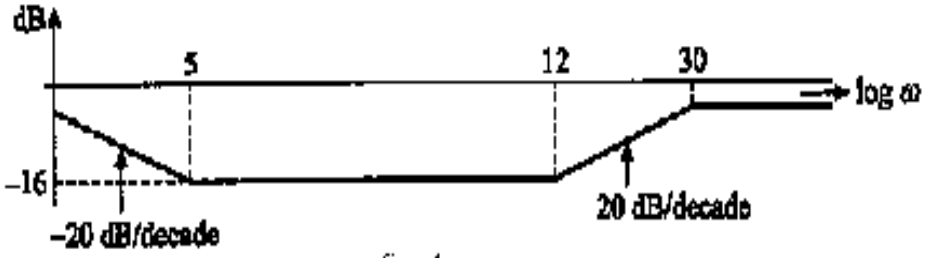

fig.1

8 Explain the effect of PD compensation on the performance of the system.
9 Mention the merits and demerits of frequency response techniques over time domain techniques.
10 Define State Transition Matrix and mention its properties.

PART – B (50 Marks)

11 For the system given in fig.2 obtain the transfer function $T(S) = \frac{x_3(S)}{F(S)}$. 10

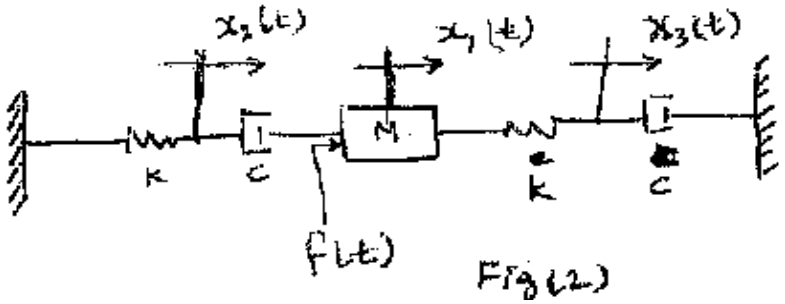

Fig (2)

..2

12 a) Determine the transfer function $T(S)=\frac{C(s)}{R(s)}$ for the signal flow graph given in fig.3. 5

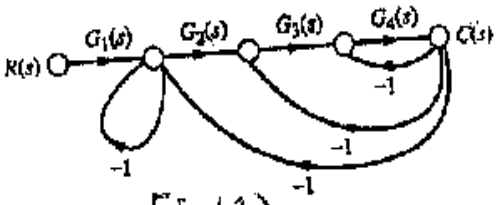

Fig (3)

b) For the system given in fig.4. Find steady state error for unit step and Ramp inputs. 5

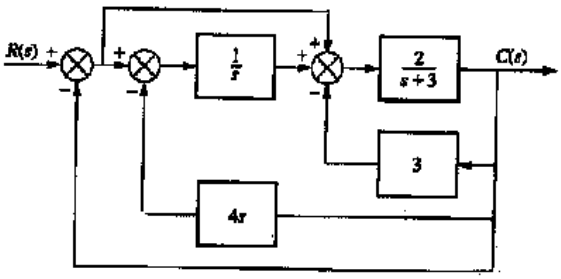

Fig (4)

13 For the unity feedback given below, sketch the complete Root Locus and determine the following : 10

i) Find the location of closed loop dominant poles if the system has 15% overshoot.

ii) Find the corresponding valve gain factor K

$$G(S)=\frac{K}{(S+3)(S^2+4S+5)}$$

14 Sketch the Bode plot and determine Gain crossover frequency, phase crossover frequency, gain margin and phase margin for $G(s)=\frac{2000e^{-0.2s}}{s(s+5)(s+50)}$. 10

15 Sketch the polar plot and determine gain margin, phase margin and range of stability according to Nyquist Criterion of a unity feedback system given by $G(s)=\frac{K(s+3)}{s^2(s-1)}$.

16 Check the controllability and observability of a unity feedback system represented by $G(s)=\frac{20S^2+14S}{S^3+19S^2+111S+189}$ 10

17 Write short notes on the following : 10

i) Correlation between frequency and time domain second order response specifications.

ii) Importance of Laplace transforms in control systems.

iii) PID controller

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Code No. 5192 / S

FACULTY OF ENGINEERING

B.E. 3/4 (AE) II – Semester (Suppl.) Examination, January 2016

Subject : Finite Element Analysis

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1 Explain the principle of finite element method. 2
2 Derive strain displacement matrix for beam element. 3
3 Calculate the material matrix for constant strain triangular element. E = 350 GPa, v = 0.28. 3
4 State the Hamilton's principle and equation of motion in terms of generalized variables. 3
5 Derive the shape function matrix for 8-node quadrilateral element. 3
6 State the governing differential equation for 3-dimensional heat transfer problem with boundary conditions. 3
7 Write the characteristics of stiffness matrices. 3
8 Evaluate the following integral using using two point gauss integration. 3

$$I = \int_{-1}^{1} \left(5x^4 + 3x^3 + 6x^2 + 4\right) dx$$

9 List finite element technique software and general steps that followed in software. 2

PART – B (50 Marks)

10 Calculate the displacement and element stresses for the stepped bar shown in fig.1 E = 200 GPa, A = 500 mm^2, ΔT =50^{0}C , α= 5 x 10^{-6} / ^{0}C.

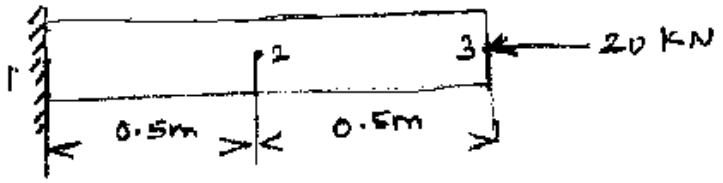

Fig 1

11 Two-member plane truss supported by a linearly elastic spring as shown in Fig.2. the truss members are solid circular cross section having d = 30 mm and E = 100 GPa. The linear spring has stiffness constant 50N/mm. Calculate the displacements of the unconstructrained node and stress each member.

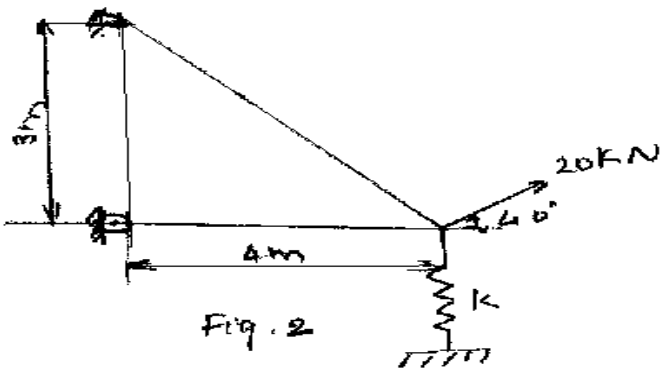

Fig. 2

..2

12 Calculate the deflection and shear force for the beam shown in fig.3.

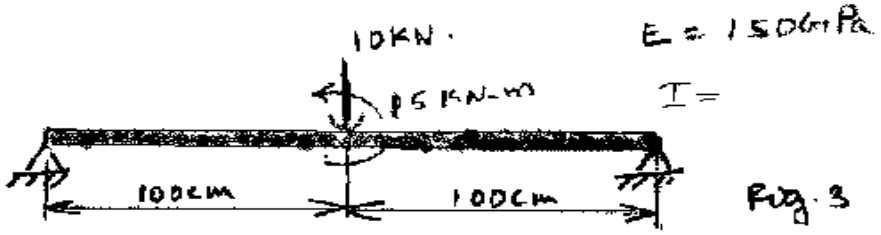

Fig. 3

13 Derive Jacobean and strain displacement matrix, and load vector for 3-node triangular element shown in Fig.4. E = 80 GPa, ^{3} = 0.28, P = 15 KN/m.

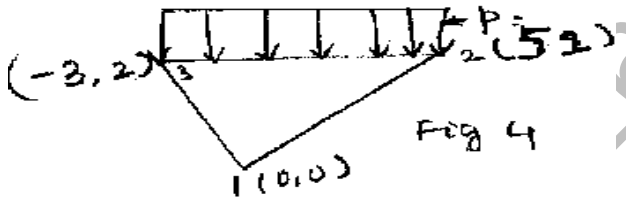

Fig 4

14 Calculate the temperature distribution of a fin shown in Fig.5 with two linear elements. The fin is square in cross-sectional and is 10 cm long and 1cm wide. Assume convection heat loss occurs from the end of the fin. K = 5W/cm^{0}C, h = 0.4W/cm^{2} ^{0}C, Ø∞=25^{0}C.

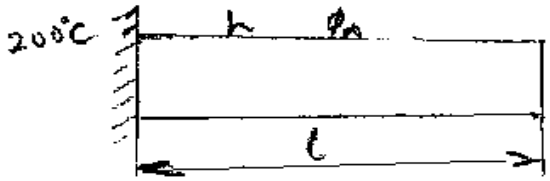

Fig. 5

15 Evaluate the eigen value and eigen vector for the bar shown in Fig.6, E = 200 GPa, ° = 8000 Kg / m^{3}.

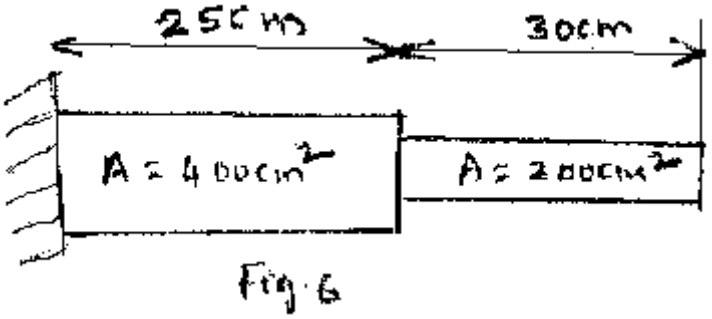

Fig. 6

16 a) Explain the finite element formulation of 1-D unsteady state heat transfer problem.

b) Discuss tetrahedron element used in 3-D structural formulation.

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Code No. 5197 / S

FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II – Semester (Suppl.) Examination, January 2016

Subject : Object Oriented System Development

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1	Which UML diagrams give static and dynamic view of a system.	2
2	What are events? Describe different kinds of events.	3
3	List the 4P's in unified development process.	2
4	Differentiate between association and aggregation.	2
5	Write about the purpose of activity diagrams.	3
6	Write the steps involved in modeling static and dynamic types.	3
7	What are the four important properties of components?	2
8	Name the workers involved in the design workflow.	2
9	Explain testing and various types of testing.	3
10	What are the common modeling techniques of a class diagram?	3

PART – B (50 Marks)

11	a)	What is the significance of importing and exporting of packages?	4
	b)	What is object diagram? What are common modeling techniques of object diagram?	6
12		Explain in detail about the significance of iterative and incremental development process.	10
13	a)	What are supplementary requirements? Explain.	5
	b)	Explain about requirements workflow with diagrams.	5
14	a)	What are processes and threads? Explain in detail.	5
	b)	Explain the modeling techniques of interprocess communication and multiple flows of control.	5
15		Explain in detail about the advanced relationships along with the stereotypes that may be applied for the relationships.	10
16	a)	Explain about instances and its abstractions, names and operations.	5
	b)	Explain in detail about the common mechanisms in UML.	5
17	a)	Define interaction diagrams. What are their contents and common properties? Define semantic equivalence between two kinds of interaction diagrams.	6
	b)	Explain the common modeling techniques of time and space.	4

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Code No. 5199 / S

FACULTY OF INFORMATICS

B.E. 3/4 (I.T.) II - Semester (Suppl.) Examination, January 2016

Subject : Computer Networks

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1	Define congestion and discuss about causes for it.	(3)
2	Discuss briefly about TCP / IP protocol suit.	(3)
3	What is meant by tunneling in the context of mobile IP?	(2)
4	Differentiate between IPV4 and IPV6.	(3)
5	What are elements sockets? Discuss briefly.	(3)
6	Write the functions of transport and network layers.	(2)
7	Name the fields of a resource record.	(3)
8	What is meant by voice over IP in multimedia?	(2)
9	Briefly explain about web security.	(2)
10	What is the difference between private key and public key?	(2)

PART – B (50 Marks)

11	(a) What are the Network layer design issues? Explain.	(4)
	(b) What are reference models? Explain about the TCP / IP reference model.	(6)
12	(a) Draw the header format of IP protocol and explain it.	(6)
	(b) Discuss about OSPF and BGP in detail.	(4)
13	(a) What is meant by Non blocking I/O?	(5)
	(b) Describe about interperability of IPV4 and IPV6.	(5)
14	(a) What are static web documents? Explain about wireless web.	(4)
	(b) Describe the architecture of electronic mail.	(6)
15	Explain about symmetric key algorithm.	(10)
16	Explain about authentication protocols.	(10)
17	Write short notes on the following:	
	(a) DNA name space	(5)
	(b) Routing algorithms	(5)

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