

FACULTY OF ENGINEERING**B.E. 3/4 (Civil) II – Semester (Suppl.) Examination, December 2016****Subject: Water Resources Engineering and Management – I****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 Write two advantages of recording rain gauges. (2)
- 2 Find the radius of circle of influence if the hydraulic conductivity is 40 m/day. (2)
- 3 Water is released at the rate of 12 cumecs at the head of a canal. If duty at the field is 1250 Ha/cumec and loss of water in transit is 20%, find the area of the land that can be irrigated. (3)
- 4 What are the various causes of failure of weirs on permeable foundations? (3)
- 5 List out the benefits of irrigation? (2)
- 6 Differentiate between non-modular, semi-modular and modular outlets. (2)
- 7 State the functions of head regulator. (2)
- 8 What are the different types of C-D works (3)
- 9 What is the need of farmers participation in water management? (3)
- 10 What is meant by sustainable water resources management? (3)

PART – B (5x10 = 50 Marks)

- 11 a) Explain the following:
 - i) Darcy's law and its applications.
 - ii) Storage coefficient of an aquifer and specific capacity of a well. (5)
- b) Two tube wells, each of 10 cm diameter are placed at 100 m distance. Both the wells penetrate fully a confined aquifer of 12m thickness. Calculate the discharge if only one well is discharging under a depression head of 3m. What will be the percentage decrease in the discharge of the well if both the wells are discharging under the depression head of 3m take radius of influence for each well equal to 250m and coefficient of permeability of aquifer as 60 metres/day? (5)
- 12 a) What is balancing depth of cutting? Derive an expression for the balanced depth. (5)
- b) Design an irrigation channel to carry a discharge of 45 cumecs. Assume $N = 0.0225$ and $m=1$. The channel has a bed slope of 0.16 meter per kilometer. (5)
- 13 a) Draw the neat sketch of the general layout of a diversion headwork and explain the functions of its various components. (5)
- b) Discuss the procedure of hydraulic calculations in the design of vertical drop weir. (5)
- 14 a) Discuss various types of alignments for an offtaking canal. (5)
- b) Explain the procedure for the design of a trapezoidal notch fall. (5)

- 15 Write short notes on
- i) Integrated water management (5)
 - ii) Systematic canal operation (5)
- 16 Explain Khosla's method of independent variables. How do you apply corrections for
- i) Thickness of floor
 - ii) Interference of piles
 - iii) Inclination of floor (10)
- 17 a) Write a note on selection of suitable type of cross-drainage works. (5)
- b) Define sensitivity of an outlet. Find the relation between sensitivity and flexibility of an outlet. (5)

FACULTY OF ENGINEERING

B.E. 3/4 (EE/Inst./ECE) II–Semester (Suppl.) Examination, Nov./Dec. 2016

Subject : Managerial Economics and Accountancy**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 | Define Managerial economics. | 2 |
| 2 | Explain laws of equi-marginal utility. | 2 |
| 3 | Differentiate implicit cost from explicit cost. | 2 |
| 4 | Explain net working capital. | 2 |
| 5 | Double entry system of book keeping. | 2 |
| 6 | Explain Risk and uncertainty. | 3 |
| 7 | Discuss cross elasticity of demand. | 3 |
| 8 | Match the following : | 3 |
| | Micro economics -- Two sellers | |
| | Price elasticity -- Managerial economics | |
| | Monopoly -- Price & Quantity relation | |
| | -- One seller | |
| 9 | Explain break even analysis. | 3 |
| 10 | Discuss liquidity ratios | 3 |

PART – B (5 x 10 = 50 Marks)

- 11 Explain the features and scope of managerial economics.
- 12 Discuss the methods to forecast demand.
- 13 Explain cost output relation in the short run.
- 14 Discuss the determinants of working capital.
- 15 Calculate P/V ratio, break even point and sales to earn a desired profit from the following information sales Rs.800000, variable cost Rs.300000, fixed cost Rs. 200000. Desired profit Rs.60000.
- 16 Calculate NPV and suggest the acceptability of a project. The project requires an initial outlay of Rs.500000 with an estimated life of 5 years cost of capital is 8%. The cash inflows after taxes are as follows.

Years	1	2	3	4	5
Cash flows	100000	250000	300000	275000	300000

17 Prepare trading & and profit and loss account of Ajay for the year ending 31-12-2012 and a balance sheet on that date.

Debit balances	Rs.	Credit balances	Rs.
Purchases	175000	Sales	250000
Opening stock	40000	Bank overdraft	25000
Buildings	135000	Creditors	60000
Cash in hand	5000	Capital	79500
Salaries	12000	Commission	2000
Wages	8000		
Rent, Rate and Taxes	2000		
Insurance	500		
Plant and Machinery	20000		
Debtors	14000		
Drawings	5000		

Adjustments : Closing stock Rs.30000

Prepaid insurance Rs.100

Depreciate plant and machinery by 10%

FACULTY OF ENGINEERING

B.E. 3/4 (Mech.) II-Semester (Supplementary) Examination, Nov. / Dec. 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 (25 Marks)**

- 1 Classify the types of control systems.
- 2 Derive the transfer function of closed loop system.
- 3 Discuss the standard test signals.
- 4 What is the effect of addition of poles to the closed loop transfer function?
- 5 Check whether the given system is stable or not
 $s^5 + s^4 + 24s^3 + 48s^2 - 25s - 5 = 0$
- 6 Sketch the polar plot for $G(s) = \frac{1}{s^2(s+1)}$.
- 7 Define the state transition matrix and write down its properties.
- 8 Define the time domain specifications of second order system.
- 9 What is type and order of the given system?

$$G(s) = \frac{s^2 + 9}{s^2(s^2 + 3s + 1)}$$

- 10 Mention the effect of PD compensation on the nature of system.

PART – B (50 Marks)

- 11 Derive the transfer function of D.C. servomotor.
- 12 A unity feedback control system is characterized by the following open-loop transfer function.

$$G(s) = \frac{0.4s + 1}{s(s + 0.6)}$$

Determine the transient response for unit-step J/P.

Evaluate the maximum overshoot and the corresponding peak time.

- 13 Sketch the root locus plot of the open loop transfer function given below

$$G(s)H(s) = \frac{K}{s(s+2)(s^2+2s+5)}$$

- 14 Sketch the Bode plot for the following transfer function and for $k = 10$

$$G(s)H(s) = \frac{k e^{-0.1s}}{s(1+s)(1+0.1s)}$$

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15 Sketch the Nyquist plot and calculate the range of stability

$$G(s)H(s) = \frac{K(s+4)}{s^2(s+1)}$$

16 Obtain the time response of the system described by

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -1 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 1 \\ -1 \end{bmatrix} 4$$

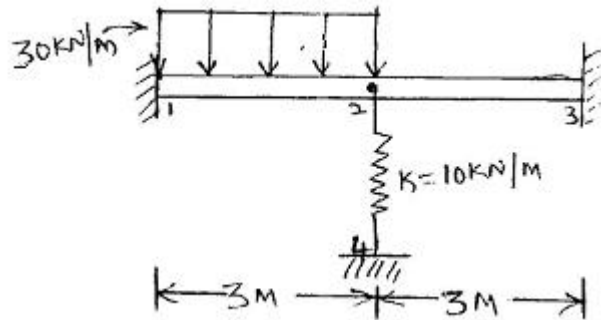
with the initial condition $\begin{bmatrix} x_1(0) \\ x_2(0) \end{bmatrix} = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$ $y = [0 \ 1] \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$.

17 Write short notes on the following :

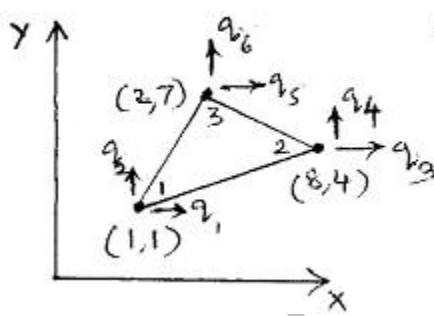
- i) Time response specifications
- ii) PI, PID controllers
- iii) Mason's gain formula

13 For the structure shown find the deflection at node 2 of the beam take 9000KN-m^2 .

$EI =$



14 For the triangle element shown in fig obtain the strain-displacement relation matrix and determine the strains ϵ_x , ϵ_y and γ_{xy} .

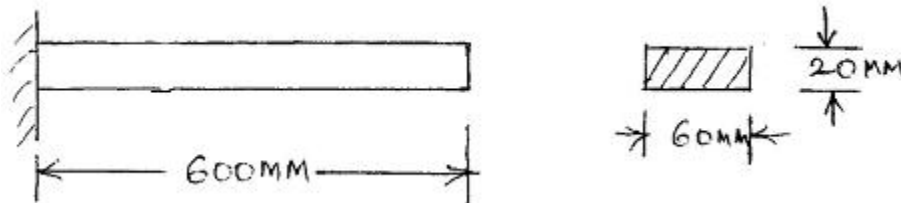


$$q_1 = 0.001, q_2 = -0.004, q_3 = 0.003$$

$$q_4 = 0.002, q_5 = -0.002, q_6 = 0.005$$

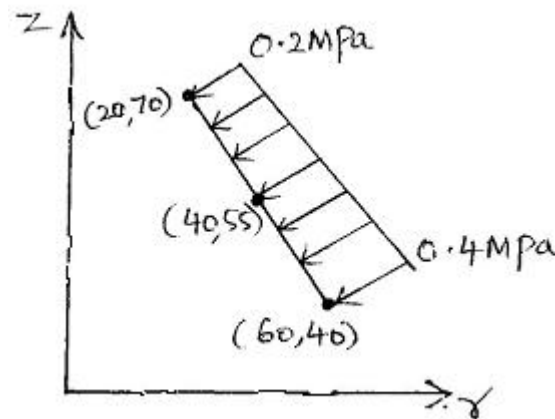
15 A metallic fin with thermal conductivity $70\text{W/m}^\circ\text{C}$, 1cm radius and 5cm long extends from a plane wall whose temperature is 140°C . Determine the temperature distribution along the fin if heat is transferred to ambient air at 20°C with heat transfer co-efficient of $5\text{W/m}^2^\circ\text{C}$. Take 2 elements along the fin, neglect temperature variation across the cross section conduction is along the length and convection along the periphery?

16 Determine all natural frequencies of the steel cantilever beam using 1-D element model? Take $E = 200\text{GPa}$, $\rho = 7800\text{kg/m}^3$.



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- 17 An axisymmetric body with linearly distributed load on the conical surface is shown in fig. Determine the equivalent point loads at the nodes.



OU - 1607

FACULTY OF ENGINEERING**B.E. 3/4 (CSE) II-Semester (Supplementary) Examination, Nov. / Dec. 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 | Define the basic building blocks of UML. | 3 |
| 2 | Explain different types of relationships with notations. | 3 |
| 3 | Define packages and instances. | 2 |
| 4 | What is a use case? Explain with example. | 2 |
| 5 | What is an object diagram? | 2 |
| 6 | Discuss about state machine. | 2 |
| 7 | Explain patterns and frame works with example. | 3 |
| 8 | What is a use case process? | 3 |
| 9 | Define 4 P's. | 2 |
| 10 | Define iterative and incremental process. | 3 |

PART – B (50 Marks)

- | | | |
|----|---|----|
| 11 | What is a use case diagram? Define a use case diagram for a banking system with suitable actors, use cases and stereotypes that apply to use cases. | 10 |
| 12 | a) What are interaction diagrams? Explain with an example. | 5 |
| | b) What is a deployment diagram? | 5 |
| 13 | a) Explain artifact diagram with an example. | 5 |
| | b) Differentiate between deployment and collaboration diagrams. | 5 |
| 14 | a) Explain iterative and incremental process. | 5 |
| | b) Define the terms : | |
| | i) System and model | 3 |
| | ii) Event and signal | 2 |
| 15 | Explain software development life cycle using unified model with a neat diagram. | 10 |
| 16 | What is a workflow? Explain the architecture centric process involving core work flows. | 10 |
| 17 | a) Explain the concept of forward engineering with an example. | 5 |
| | b) Explain the following phases. | |
| | i) Test | |
| | ii) Implementation | 5 |

FACULTY OF INFORMATICS**B.E. 3/4 (IT) II-Semester (Supplementary) Examination, Nov. / Dec. 2016****Subject : Computer Networks****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 | List the two ways in which the OSI and TCP/IP reference models are same. | 3 |
| 2 | Give reasons for using layered protocols. | 2 |
| 3 | Convert the IP address whose hexadecimal representation is D22F1529 to dotted decimal notation. | 2 |
| 4 | List and explain about 1-bit flags in TCP header. | 3 |
| 5 | Discuss the elements of Socket-in structure. | 3 |
| 6 | Briefly explain about interoperability of IPV4 and IPV6. | 2 |
| 7 | List the SNMP message types. | 2 |
| 8 | What are the functions supported by e-mail application? | 3 |
| 9 | Give the significance of message digest. | 2 |
| 10 | Define public key and private key. | 3 |

PART – B (50 Marks)

- | | | |
|-------|---|---|
| 11 a) | Explain about the key design issues in Network layer. | 4 |
| b) | Classify the routing algorithms and explain any 3 algorithms. | 6 |
| 12 a) | Explain about the available scenario for establishment of TCP connection. | 6 |
| b) | Explain about ICMP message types. | 4 |
| 13 a) | Explain about connection-oriented communication with block diagram using elementary system calls. | 5 |
| b) | List advanced socket system calls and explain any two. | 5 |
| 14 a) | Explain about the fields of DNS resource record. | 5 |
| b) | Explain about architecture of E-mail system. | 5 |
| 15 a) | Explain about DES algorithm. | 6 |
| b) | Explain about transpositional cipher with an example. | 4 |
| 16 a) | Differentiate between connection oriented and connectionless communication. | 5 |
| b) | Explain about internet control protocol. | 5 |
| 17 | Write a short notes on the following : | |
| a) | Web-security | 5 |
| b) | DNS | 5 |
