

FACULTY OF ENGINEERING**B.E. 4/4 (Civil) I – Semester (Main & Backlog) Examination, December 2017****Subject: Water Resources Engineering – II****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A and any five questions from Part B.****PART – A (25 Marks)**

- 1 State the purpose of creating a Retarding reservoir. 2
- 2 State what you understand by Active Capacity of Reservoir. 2
- 3 State the situations where the side channel spillway is preferred. 3
- 4 Distinguish between rigid and non-rigid Dams. 2
- 5 Compute the maximum horizontal force acting on dam face when the reservoir has 30 meters of water and also its location from base. 3
- 6 State the main function of Galleries in Dams. 3
- 7 State the measures to control the pore pressure in Earthen Dams. 3
- 8 At a site proposed for runoff river plant the head available on average is 8 m in a day. Compute the possible generating capacity of power generation per million cubic meters of flood water when efficiency is limited to 72%. 3
- 9 List out various types of energy dissipating devices used in India. 2
- 10 Distinguish between Head race channel and Tail race channel in hydropower station. 2

PART – B (5x10 = 50 Marks)

- 11 a) Explain how the following control levels are fixed in any reservoir. 4
 - i) Minimum Draw Down Level (MDDL)
 - ii) Full Reservoir Level (FRL)
- b) The inflow and demand data at a site of reservoir is given below. Compute the capacity of reservoir to meet the given demand. Neglect losses. 6

Month	January	February	March	April	May	June
Flow in $m^3 \times 10^6$	140	35	40	45	20	55
Demand $m^3 \times 10^6$	40	60	20	25	10	100
Month	July	August	September	October	November	December
Flow in $m^3 \times 10^6$	170	210	110	70	50	40
Demand $m^3 \times 10^6$	110	140	130	110	90	60

- 12 A Concrete Dam section is shown in Figure-1, Check the stability of dam for the following conditions and compute the maximum stresses. Neglect Earth quake forces and assume full uplift when Reservoir is full. Assume unit weight of concrete as 24 kN/m^3 and shear friction coefficient as 0.75 and shear strength of joint as 3000 kN/m^2 . Assume any data required suitably.
 - i) Reservoir Empty Condition
 - ii) Reservoir Full up to Full Reservoir Level

- 13 a) Draw a typical cross section of Modified Homogeneous Earthen Dam and explain each component and their function. 5
 b) Discuss the design criteria for the Earth Dams. 5
- 14 a) Compute the effective length and height of water above the spillway which has a D/S slope of 0.7 H: 1V. The design discharge is 8000 cumecs. The average bed level is 150.0 m and spillway level is 210.0 m. The spillway comprises of 6 spans of 8 m each. Consider the thickness of each pier as 2.0 m. Also design the D/S profile of spillway. 5
 b) Discuss briefly various types of dissipaters that are used for energy dissipation below overflow spillways, under different conditions of Jump Height Curve and Tail Water Curve. 5
- 15 a) A run off river plant has installed capacity of 40000 kW operates at 46% load factor when it serves as peak load station. 5
 i) What should be the minimum discharge in the stream, so that it may serve as base load station? Assume plant efficiency 85% when working under head of 24 m.
 ii) Also calculate the maximum load factor of the plant when the discharge in the stream is 60 cumecs.
 b) Explain in detail about Intake structures of Hydropower plants. 5
- 16 a) Explain various failures of Earthen Dams and state the remedial measures for the same. 5
 b) With the help neat sketch explain various components of side channel spillway and state the conditions at which this spillway is preferred. 5
- 17 Write a detailed note and working principle with aid of figures of the following: 10
 a) Siphon spillway
 b) Differential Surge Tank

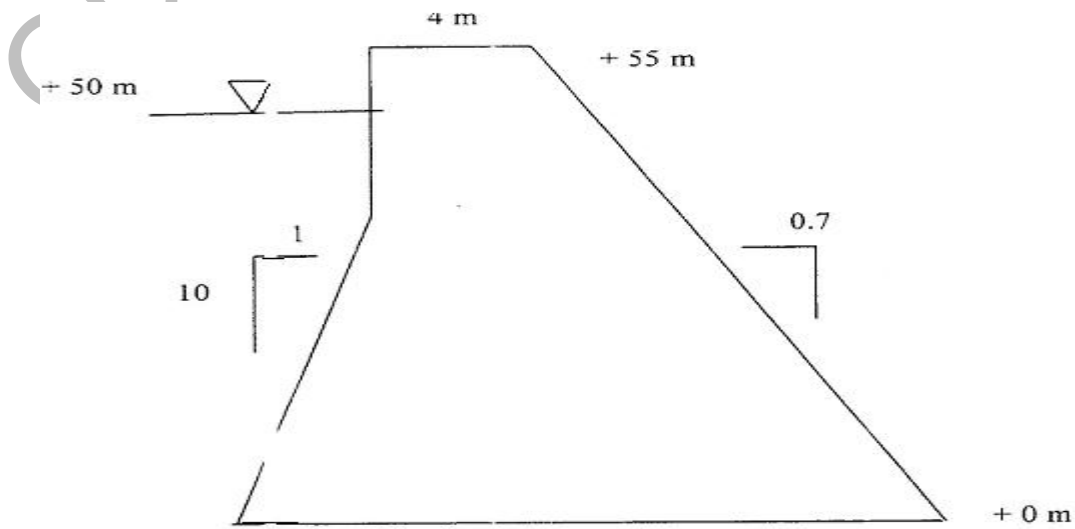


Figure - 1

FACULTY OF ENGINEERING**B.E. 4/4 (EIE) I-Semester (Main & Backlog) Examination, Dec, 2017****Subject : Opto-Electronic Instrumentation****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. Mention properties of lasers generation. (2)
2. In a two energy level system transition of higher to lower energy levels emit Wave Length of 350 nm. Calculate the ratio of the population of two energy levels at 27°C wave gain $g_1 = g_2$. (3)
3. List out the laser application in Engineering. (3)
4. Compute the NA, Acceptance angle and the critical angle of the fibre core having Refractive index=1.0 and cladding refractive index=1.05. (3)
5. Mention different types of fibre fabrication techniques. (2)
6. What is meant by Acousto-optic modulation technique. (3)
7. Write the advantages of fibre optic sensors over electrical sensor. (2)
8. Explain liquid level measurement using fibre optic sensor. (3)
9. Mention the special features of LDRs. (2)
10. Calculate the efficiency of PIN diode if the responsivity is 0.58 A/W at 800nm. (2)

PART – B (50 Marks)

11. a) 'Explain with necessary diagrams mechanisms of Carbondioxide Lasers. (5)
b) Explain gas lasers with their respective energy levels with suitable diagram. (5)
12. With necessary diagrams explain the following application of laser. (10)
a) Laser Nephelometry b) Laser cutting.
13. a) Explain any one type of laser interferometer. (5)
b) Explain in details of losses in Optical Fibre. (5)
14. a) How fibre optic sensors are classified. What is basic principle of Fibre optic sensor with suitable diagram. (5)
b) How the current and voltage is measured using optical fibre. (5)
15. a) Explain the working principle of Photodiode with relevant waveforms. (5)
b) Explain the operation of Optoisolator with neat diagram (5)
16. a) Explain the safety precaution while using Lasers. (5)
b) Write short note on LCD. (5)
17. a) Explain Holographic Technique of reconstructing a 2-D image. (5)
b) Write short notes on Nd-YAG Lasers. (5)

FACULTY OF ENGINEERING**B.E. 4/4 (ECE) I-Semester (Main & Backlog) Examination, December 2017****Subject: Industrial Administration and Financial Management****Time: 3 Hours****Max. Marks: 75**

Note: Answer All Questions From Part–A. Answer any FIVE Questions From Part-B
 Answer to the questions of Part – A must be at one place and in the same order as they occur in the question paper. Missing data if any may suitable be assumed.

PART-A (10 x 2.5 = 25 Marks)

1. List the function of management.
2. State the advantages of line organization structure
3. Define the term work study
4. Enumerate the various symbols used in method study.
5. State the objectives of inspection
6. What are the Principles of statistical quality control?
7. Who are materials classified?
8. What are the duties of purchase manager?
9. State the assumptions in break even analysis
10. What are the techniques of capital budgeting?

PART-B [5 x 10 = 50 Marks)

11. a) Draw line and staff organization structure, explain its function, state merits demerit and applications
 b) Differentiate between product layout and process layout
12. a) Explain the principle of motion economy related to human body and work place layout
 b) Explain any three job evaluation methods.
13. a) Explain how quality circles helps to improve the productivity
 b) Plot the necessary control chart using the following data with a sample size of five items. Find out whether the process is under control or not. (standard data : $d_2 = 2.326$, $A_2 = 0.58$, $D_3 = 0$, $D_4 = 2.11$)

Sample No	1	2	3	4	5	6	7	8	9	10
x-	5.004	5.204	5.104	5.008	5.009	5.010	5.030	6.010	5.016	5.010
R	0.02	0.08	0.03	0.05	0.04	0.09	0.04	0.04	0.05	0.07

14. a) Derive an expression for simple EOQ and state their assumptions.
 b) A small engineering project consists of nine activities. Draw the network. Calculate EST and LST of each activity. Calculate total slack for each activity

Activity	Time duration (Days)	Immediate predecessor
1-2	6	---
2-3	13	1-2
1-6	5	---
6-7	11	1-6
7-8	15	6-7
2-4	4	1-2
3-5	11	2-3
4-5	6	2-4
5-8	3	3-5, 4-5

15. a) How breakeven analysis is useful for business organization
 b) Estimate selling price per unit of electronic component. Following information is for 300 items: Direct material cost is Rs. 1,50,000 Direct labor cost is Rs 85,000 direct expense are Rs. 3,25,000 factory on cost is 15% selling distribution expense are 10% assume profit is 17%
16. a) Explain method study Procedure
 b) Differentiate between Private Ltd and Public Ltd Company.
17. Write short notes on following
 a) Cost of capital
 b) Materials planning
 c) Quality circles

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B.E. 4/4 (M/P) I – Semester (Main & Backlog) Examination, December 2017

Subject: Finite Element Analysis

Time: 3 Hours

Max.Marks: 75

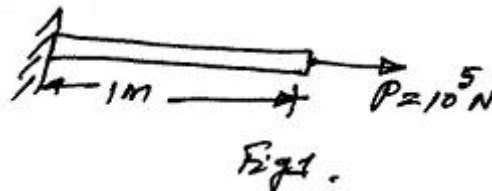
Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

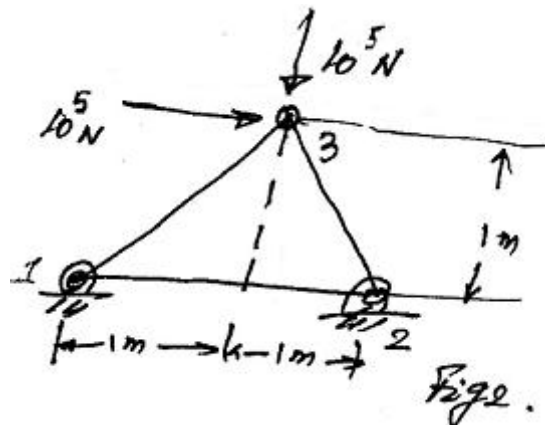
- 1 Write the strain displacement relationship for axial, torsional and beam elements.
- 2 Define minimization of potential energy and virtual work principle.
- 3 Derive the transformation matrix for the element axis coordinates to any angle of orientation of the element.
- 4 Compare truss, frame and beam elements.
- 5 If $N_1 = 0.25$, $N_2 = 0.45$ and $q = \{0.0, 0.1, 0.2, 0.3, 0.1, 0.2\}^T$ mm are displacements in the CST element then find the element displacement function.
- 6 Sketch the shape functions variations in the axisymmetric triangular element and explain.
- 7 What is numerical integration and Gaussian quadrature?
- 8 Determine the stiffness matrix of torsion of circular shaft.
- 9 Sketch the modes of modes shapes of stepped bar.
- 10 Write the 'B' matrix of 3D element.

PART – B (5x10 = 50 Marks)

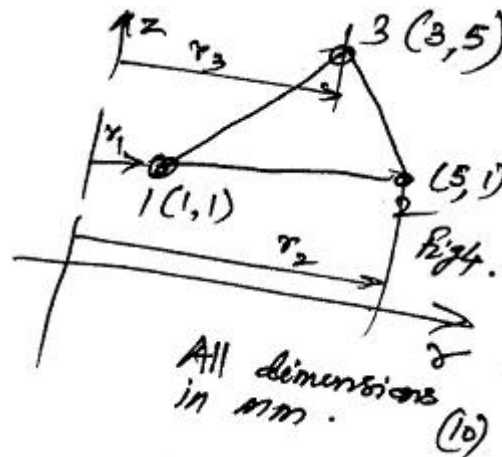
- 11 For the axial member shown in Fig. 1, subjected to a load P , determine the displacement at the load and at mid point using quadratic element? Also estimate the strains and stresses in the element. Take $E = 200$ GPa, $A = 10^{-8}$ m². 10



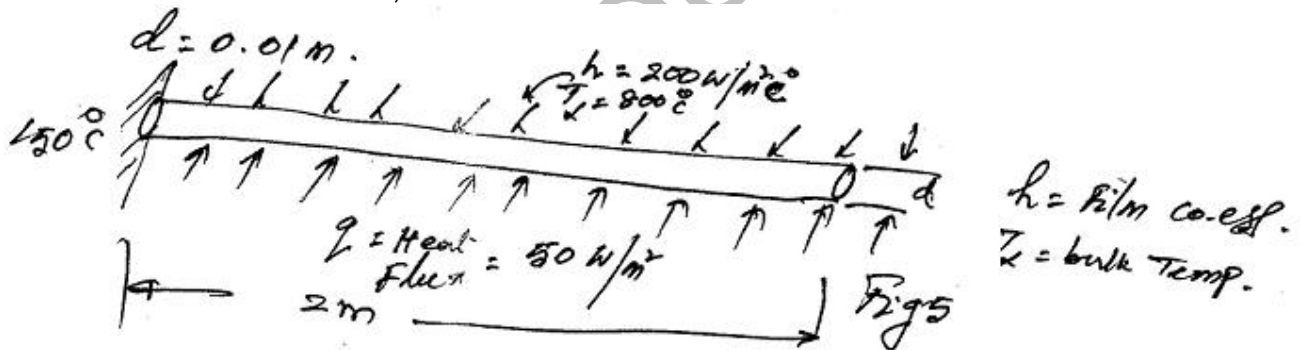
- 12 For the plane truss shown in Fig. 2, determine the displacement at node 3 and stresses in each member if $E = 100$ GPa, $A = 10^{-8}$ m². 10



- 13 If $E = 200 \text{ GPa}$, $\nu = 0.3$, for the axisymmetric 3-nodes triangular element, find the stiffness matrix (Fig. 4). 10



- 14 For the fin shown in Fig. 5, determine the temperature distribution with two elements. Take $K = 50 \text{ W/m}^\circ\text{C}$, dia $d = 0.01 \text{ m}$. 10



- 15 Derive the eigen values and eigen vectors for a beam. 10
- 16 a) Derive the consistent mass matrix for 2D beam element. 5
 b) Write the governing equations and solutions to one dimensional heat flow in a rod. 5
- 17 Write the following: 10
- Galerkin's formulations for solution of field problems.
 - Jacobian matrix for 4-nodes quadrilateral element.
 - Convergence requirements.

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B.E. 4/4 (AE) I - Semester (Main & Backlog) Examination, December 2017

Subject : Vehicle Maintenance

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 List out the importance of maintenance.
- 2 List out the special tools to be used in the maintenance an engine.
- 3 Define engine tune up.
- 4 Explain any one engine cleaning method.
- 5 Define clutch drag and clutch slip.
- 6 How is battery voltage determined?
- 7 What are the advantages of an alternator over dynamo?
- 8 What is the purpose of a capacitor in a coil ignition circuit?
- 9 What is the function of a engine lubrication systems?
- 10 What are the probable causes for non function of an electric horn of a car?

PART – B (50 Marks)

- 11 What are the safety precautions to be considered in the maintenance of an automobile?
Explain scheduled and break down maintenance of an automobile.
- 12 Write the step by step procedure of overhauling a multi cylinder diesel engine.
- 13 Explain different problems that may effect the performance of a hydraulic braking system with drum brakes.
- 14 Discuss the various troubles experienced in mechanical type transmission and explain their causes and remedies.
- 15 Explain briefly the maintenance and serving of an automobile electrical systems.
- 16 Explain the following:
 - (a) Anticorrosion and antifreeze additives
 - (b) Vehicle body maintenance
- 17 (a) Explain types of thermostart used in cooling system.
(b) State causes and remedy for not building up lubricating oil pressure

FACULTY OF ENGINEERING & INFORMATICS**B.E. 4/4 (CSE/IT) I - Semester (Main & Backlog) Examination, December 2017****Subject : Information Security****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 Explain the Mc Cumber cube and illustrate its role in Information security. (2)
- 2 What is the difference between DoS and DDoS attack? Which one of them is more dangerous? (3)
- 3 What is a policy and how does it differ from Law? (2)
- 4 Specify reasons why risk appetite varies from organization to organization. (3)
- 5 Highlight the relationship between policy, standards and practices / procedures / Guidelines. (2)
- 6 List the three concerns to be addressed while selecting a firewall for an organization. (3)
- 7 Give advantages and disadvantages of padded cell. (3)
- 8 Discuss the commonly used attacks on crypto systems. (2)
- 9 Short list the various roles for staffing the information security functions. (3)
- 10 When an employee leaves the organization, discuss the activities to be performed under employment polices and matches. (2)

PART – B (50 Marks)

- 11 (a) Explain the various components of Information systems. (5)
(b) Illustrate few commonly encountered software development security problems. (5)
- 12 Describe the various stages of risk management and explain the stages of it with neat diagrams. (10)
- 13 (a) Define and elaborate the process of contingency planning. (5)
(b) Briefly describe the different ways for protecting remote connections. (5)
- 14 Discuss the protocols used for secure connections. (10)
- 15 Elaborate the major subject areas recommended for security maintenance. (10)
- 16 Statistical analysis, wouldn't be alone sufficient for performing risk analysis. Identify the qualitative risk control practices to be adopted by organization. (10)
- 17 Write short notes on the following: (10)
 - (a) Security Blueprint
 - (b) Scanning and Analysis Tools
 - (c) Non-technical aspects of security