

**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I – Semester (Main) Examination, December 2017****Subject: Pre-Stressed Concrete (Elective – I)****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A and any five questions from Part B.****PART – A (10 x 2.5 = 25 Marks)**

- 1 Discuss different types of anchorages used in pre-stressing systems.
- 2 What is meant by tendon? Sketch the profile of any two tendons.
- 3 Explain the mechanism of shear failure in the beams.
- 4 What is thrust line?
- 5 What are the factors influencing short term and long term deflections?
- 6 Give the deflection equation for trapezoidal tendon profile.
- 7 Define equivalent prism.
- 8 What is a concordant cable profile?
- 9 Write a note on end zone reinforcement in end block.
- 10 Give any three advantages of continuous beams.

**PART – B (5x10 = 50 Marks)**

- 11 A prestressed concrete beam 200x300 mm deep is prestressed with wires (area = 320 mm<sup>2</sup>) located at 50 mm from the bottom carrying an initial stress of 1000 N/mm<sup>2</sup>. The span of the beam is 10 m. Calculate the percentage loss of prestress in wires when the beam is post-tensioned. Assume  $E_s = 210 \text{ kN/mm}^2$ ,  $E_c = 35 \text{ kN/mm}^2$ . Relaxation of steel stress = 5% initial stress, shrinkage of concrete =  $200 \times 10^{-6}$ , creep coefficient = 1.6, slip at anchorage = 1 mm, friction coefficient = 0.0015 per metre. 10
- 12 A pre tensioned prestressed concrete beam having a rectangular section, 300 mm wide and 500 mm deep has an effective cover of 40 mm. If  $f_{ck} = 40 \text{ N/mm}^2$ ,  $f_p = 1600 \text{ N/mm}^2$  and the area of prestressing steel  $A_p = 561 \text{ mm}^2$ . Calculate the ultimate flexural strength of the section using IS code provisions. 10
- 13 A rectangular concrete beam of cross-section 40 cm deep and 20 cm wide is prestressed by means of 10 wires of 5 mm diameter located 6.5 cm from the bottom of the beam and 4 wires of diameter of 5 mm, 2.5 cm from the top. Assuming the prestress in the steel as 800 N/mm<sup>2</sup>. Calculate the stresses at the extreme fibers of the mid-span section when the beam is supporting its own weight over a span of 6 m. If a uniformly distributed live load of 6 kN/m is imposed, evaluate the maximum working stress in concrete. The density of concrete is 24 kN/m<sup>3</sup>. 10
- 14 A prestressed concrete beam having a cross section 300x500 mm is simply supported over a span of 12 m. It supports a uniformly distributed imposed load of 4 kN/m. The tendon follows a trapezoidal profile with an eccentricity of 100 mm within the middle-third of the span and varies linearly from the third span points to zero at the supports. The area of the tendons  $A_p = 360 \text{ mm}^2$  have effective prestress of 1100 N/mm<sup>2</sup> immediately after transfer. Using the following data, calculate: 10
  - a) The short-term deflection and
  - b) The long term deflections

Assume  $E_c = 34 \text{ kN/mm}^2$ ;  $E_s = 200 \text{ kN/mm}^2$

Creep coefficient = 2

Concrete shrinkage,  $E_{cs} = 400 \times 10^{-6}$

Relaxation of steel stress = 10%.

- 15 The end block of prestressed concrete is of size 150 mm x 200 mm, an effective prestressing force of 200 kN is transmitted. The distribution plate is of size 100 mm wide and 100 mm deep concentrically loaded at the ends. Calculate the maximum tensile force and bursting tension. Use Guyon's method. 10
- 16 A concrete beam of rectangular section, 200 mm wide and 600 mm deep, is prestressed by a parabolic cable located at an eccentricity of 100 mm at mid span and zero at the supports, if the beam has a span of 10 m and carries a uniformly distributed live load of 4 kN/m. Find the effective force necessary in the cable for zero shear stress at the support section. For this condition, calculate the principal stresses. The density of concrete is  $24 \text{ kN/m}^3$ . 10
- 17 a) Explain the effect of prestressing indeterminate structures. 5  
b) List the advantages and disadvantages of continuous members. 5

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**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I – Semester (Main & Backlog) Examination, December 2017****Subject: Geographical Information Systems (Elective – I)****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 What is a map projection and list the families of map projections. 3
- 2 How is GIS useful for making decisions under uncertainty? 2
- 3 List the basic data structures used in GIS. 2
- 4 List the various vector formats used in GIS. 3
- 5 Briefly describe a knowledge based system. 2
- 6 List the various types of digital elevation data. 3
- 7 Give a diagrammatic representation of electromagnetic radiation depicting the defining characteristics of EMR. 2
- 8 List the important characteristics of Cartosat-2. 3
- 9 Compare vector overlay and raster overlay. 3
- 10 What is the primary use of charts and list the various types of charts? 2

**PART – B (50 marks)**

- 11 a) Define map transformation and write brief notes on the various map transformations that are currently in use. 5  
b) Describe in detail the applications of GIS in Geology and Municipal works. 5
- 12 a) Describe in detail the various raster formats used in GIS. 5  
b) Write in detail about remotely sensed data. 5
- 13 a) Explain in detail about knowledge based systems in GIS. 5  
b) Briefly describe  
i) Conflation 2  
ii) Edge matching and 2  
iii) Editing 1  
operations in GIS
- 14 a) Describe the various overlay operations used in GIS. 5  
b) Describe with the help of examples and / or figures wherever necessary the following:  
i) Map annotations 2  
ii) Line styles 1  
iii) Graphic symbols 2  
used in GIS.

- 15 a) Give a diagrammatic representation of types of sensors along with suitable examples. 5
- b) What is visibility analysis? State its uses. Also give an example of performing visibility analysis using GIS. 5
- 16 a) State the satellite characteristics of IRS series. 5
- b) Explain in detail various ways of representation of data in GIS. 5
- 17 Write a detailed note on the following:
- a) Analysis of non-spatial attribute data 5
- b) Raster Polygon. 5

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**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I-Semester (New) (Main) Examination, December 2017****Subject: Geospatial Techniques (Elective-I)****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from part – A & Any five questions from part - B****Paper – A (25 Marks)**

1. What is a map? Explain the components of a map. 3
2. What is map analysis? 2
3. Explain the necessity of data compression in GIS and list the commonly used compression algorithms. 3
4. List and briefly describe the various errors in GIS. 2
5. Draw the schematic representation of “CONFLATION WORKFLOW”. 3
6. Explain briefly about spatial overlay, boundary analysis, buffer analysis neighborhood operations and connectivity functions. 3
7. List the municipal applications of GIS. 2
8. Describe briefly how GIS can be used to make decisions under uncertainty. 2
9. Define remote sensing and compare active remote sensing with passive remote sensing. 3
10. Draw the diagram depicting the electromagnetic spectrum. 2

**PART – B (50 Marks)**

11. a. Compare and contrast common coordinate system and geographic coordinate system. 5
- b. Explain the various components of a geographical information systems. 5
12. a. Describe remotely sensed data. 5
- b. Discuss the various operations involved in maintenance and analysis of spatial and attribute data. 5
13. a. Discuss the various GIS operational procedure and analytical tasks that are suited for spatial analysis. 5
- b. Describe briefly maintenance and analysis of spatial and attribute data 5
14. a. Explain the applications of GIS in agriculture. 5
- b. List the standard GIS packages being used. What is GPS and discuss its applications. 5
15. a. Discuss the various characteristics of IRS series of satellites. 5
- b. Discuss remote sensing applications to environmental modeling. 5
16. a. Discuss the various analysis functions in GIS. 5
- b. Describe ‘manual digitising’ for the purpose of entry of graphical data into GIS. 5
17. a. What is record overlay and discuss raster overlay. 5
- b. Discuss in detail vector and raster formats used in GIS. 5

**FACULTY OF ENGINEERING****B.E. 4/4 (CE/EE/EIE/M/P) I – Semester (Main & Backlog) Examination, December 2017****Subject: Entrepreneurship (Elective – I)****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A and any five questions from Part B.****PART – A (10x2.5 = 25 Marks)**

- 1 What are the objectives of Small Scale Industries?
- 2 Define Joint Stock Company.
- 3 Define Entrepreneur, Entrepreneurship and Enterprise.
- 4 Define Entrepreneurial Motivation.
- 5 Define Time Management.
- 6 Define Network Analysis.
- 7 Define Women Entrepreneur.
- 8 Differentiate between CPM and PERT.
- 9 Define Tax Holiday.
- 10 Given the project activities – construct network diagram.

Activity	A	B	C	D	E	F
Predecessor	--	A	A	B	C	D,E

**PART – B (5x10 = 50 Marks)**

- 11 a) Explain how Entrepreneurship leads to economic growth. 5
- b) What are the characteristics of an entrepreneur? 5
- 12 a) How do you analyse the market demand for project formulation? 5
- b) Explain the sources of project financing in India. 5
- 13 a) Explain how the linkage between small and medium – heavy industries for successful operation of an entrepreneurship. 5
- b) What are the environmental factors that influence an entrepreneur? 5
- 14 a) Define project formulation and explain the concept of technical analysis and its contribution in project formulation. 5
- b) Explain opportunities available for women entrepreneurship. 5
- 15 a) Explain motivational theories Maslow and McClelland. 5
- b) Explain tax burden assessment. 5

16 a) What is time management matrix? 5

b) Draw the Network diagram and find critical path method. 5

Activity	A	B	C	D	E	F	G	H
Predecessor	--	--	--	C	A,B	E,D	D	F,G
Duration	3	5	7	3	7	3	2	2

17 Draw the network diagram and find out critical path method and also find out ES, EF, CS, LF and float. 10

Event	1-2	1-3	2-4	3-4	3-5	4-9	5-6	5-7	6-8	7-8	8-9	8-10	9-10
Duration	4	1	1	1	6	5	4	8	1	2	1	8	7

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**FACULTY OF ENGINEERING****B.E 4/4 (EEE) I - Sem (Main and Backlog) Examination, December, 2017****Subject : HVDC Transmission (Elective – I )****Time : 3 Hours****Max Marks : 75****Note: Answer all questions from Part – A & any Five questions from Part – B****PART – A**

1. Name some of the applications of HVDC transmission.
2. What are the major advantages of HVDC link?
3. What is break even distance of DC transmission system?
4. Draw the equivalent diagram of rectifier and inverter.
5. Which type of costs comes under investment costs?
6. Differentiate Characteristic harmonic with non-characteristic harmonic.
7. Mention the limits for the operation of a bounded converter bridge.
8. Name of the different types of SVC schemes.
9. Define MTDC transmission.
10. Compare Series and parallel MTDC system.

**PART-B**

11. (a) Discuss the relative merits and demerits of AC and DC transmission system.  
(b) Briefly explain different types of HVDC links that are generally used.
12. With the help of neat sketches, analyze a six pulse rectifier bridge circuit with an overlap angle less than  $60^\circ$ . Deduce the relevant equations and draw the related Waveforms.
13. Compare Over voltage protection, Commutation failure and DC Circuit breakers.
14. (a) With a neat flowchart, explain about simultaneous method of solving AC/DC load flow studies.  
(b) Mention the different sources of generation of harmonics.
15. (a) Explain the principle of operation of a surge arrester.  
(b) Sketch the line diagram of a bipolar HVDC system. Indicate surge arresters on AC side, DC side and in valve hall and AC filter area.
16. (a) Classify different types of harmonic and explain briefly about each of them.  
(b) List out the salient features of Multi Terminal DC transmission.
17. Write short notes on:
  - (a) Modern trends of HVDC transmission system.
  - (b) Different types of filters used in HVDC transmission.



**FACULTY OF ENGINEERING****B.E 4/4 (EEE) I Sem (Main Backlog) Examination, December, 2017****Subject : Power Quality (Elective – I)****Time : 3 Hours****Max Marks : 75****Note: Answer all questions from part – A & any Five questions from Part – B****PART – A (25 Marks)**

1. Discuss the effect of harmonics on transformers and motors [3]
2. What are Triplen harmonics and what is their implications [2]
3. Explain any, one method of calculation of voltage sags [3]
4. What are phase angle jumps and its causes [3]
5. What is difference between voltage sag and flicker [2]
6. Why is power Quality referred to as voltage quality [3]
7. Draw the flow chart for the evaluation of Power Quality [4]
8. How can the power quality problems be classified [3]
9. What are intra-harmonics [2]

**PART-B (50 Marks)**

10. Describe in detail the classification of voltage sags in radial systems for short Circuit faults [10]
11. What is the effect of capacitor bank on power quality of distribution systems? [10]
12. Discuss the equipment sensitivity to voltage sags [10]
13. Discuss the behavior of P.S. quantities under the non-sinusoidal conditions. [10]
14. (a) What is a harmonic analyzer? Discuss in detail. [7]  
(b) Drive an expression for the magnitude and phase angle jumps of fundamental Voltage. [3]
15. Discuss the effect of pre-fault voltage on voltage sag [10]
16. Explain why the transformer fail when used in the field where as pass the tests at the factory [10]

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**FACULTY OF ENGINEERING****B.E 4/4 (Inst.) I - Sem (Main & Backlog) Examination, December, 2017****Subject : Automation in Process Control (Elective – I)****Time : 3 Hours****Max Marks : 75****Note: Answer all questions from Part – A & any Five questions from Part – B****PART – A (25 Marks)**

1. What are different cable use for interfacing a PC to sensor? (2)
2. What are the guidelines to followed in selecting an Plug in cards? (3)
3. Mention the mode of working of SCADA system. (2)
4. Draw 256 channel SCADA with single microprocessor. (3)
5. Draw the block diagram of distributed control system. (3)
6. What are the different layers of OSI? (2)
7. Explain computer control of liquid level system (3)
8. Give the flow sheet of Plastic injection moulding process. (2)
9. What are smart sensors? Give the advantages of using it. (3)
10. What is a HART protocol? (2)

**PART-B (5x10=50 Marks)**

11. (a) Explain the concept involved in data acquisition system using PC add-on card. (5M)  
(b) Write the guidelines in selecting the appropriate DA and C boards. (5M)
12. (a) Draw the block diagram of RTU and explain the basic function carried out by the RTU. (5M)  
(b) How modem is used in SCADA system with suitable diagram. (5M)
13. (a) Explain about network protocols in DCS. (5M)  
(b) Write short notes on Network adapter card. (5M)
14. (a) Explain On-line optimizing control of a Distillation Column. (5M)  
(b) Explain with suitable diagram computer control heat exchanger. (5M)
15. Explain main features of field buses FIP and PROFIBUS in detail. (10M)
16. Explain about temperature control of plastic injection moulding process. (10M)
17. (a) Write short notes on smart sensors. (5M)  
(b) Write short notes on LCU. (5M)

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**FACULTY OF ENGINEERING**  
**B.E. 4/4 (ECE) I - Semester (New) Examination, December 2017**  
**Subject: Optical Communication (Elective – I)**

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. Explain Snell's law? (2)
2. Define Critical angle? (2)
3. Explain Single mode step index fiber? (3)
4. Define Absorption? (2)
5. Briefly explain Chromatic Dispersion? (3)
6. Calculate the number of modes of an optical fiber having diameter of 50  $\mu\text{m}$ ,  $n_1 = 1.48$ ,  $n_2 = 1.46$  and  $\lambda = 0.82 \mu\text{m}$ . (3)
7. Explain Fabry – Perot Resonator? (3)
8. Define Quantum Efficiency? (2)
9. Explain the concept of SONET/SDH network? (3)
10. Compare the parameters of LED and LASER? (2)

**PART – B (50 Marks)**

11. a) Explain Elements of Optical fiber transmission link in detail? (5)  
 b) Calculate the NA, acceptance angle and critical angle of the fiber having  $n_1$  (Core refractive index) = 1.50 and refractive index of cladding = 1.45. (5)
12. a) Give expression of pulse broadening in graded index fiber. And explain (5)  
 b) What is the pulse spreading when a laser diode having a 2 nm spectral width over a length of 2km of optical fiber is used? Find the material-dispersion-induced pulse spreading at 1550 nm for an LED with a  $D_{mat} = 56.9 \text{ ns/km} \cdot \text{nm}$ . (5)
13. a) Compare the performance parameters of surface emitting LED and edge emitting LED. (5)  
 b) Explain the principle of laser action. Explain also the spontaneous and stimulated emission process. (5)
14. a) Explain the structure, principle and working of APD. (5)  
 b) In an optical receiver explain the sources of errors. (5)
15. a) With a neat sketch explain WDM scheme? (5)  
 b) Explain the rise-time budget analysis with its basic elements that contributes to system rise time. (5)
16. a) Elaborate dispersion mechanism in optical fibers. (5)  
 b) Explain Erbium-doped fiber amplifiers? (5)
17. a) Explain fiber splicing techniques? (5)  
 b) What is the need of fiber connectors in OFC? (5)

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**FACULTY OF ENGINEERING**  
**B.E. 4/4 (ECE) I - Semester (New) (Main) Examination, December 2017**  
**Subject: Digital Image Processing (Elective-I)**

**Time: 3 Hours****Max. Marks: 75****Note:** Answer all questions from Part - A and any five questions from Part - B.**PART-A (20 Marks)**

1. Define weber ratio. (3)
2. Write the expression to find the number of bits to store a digital image. (2)
3. Obtain Hadamard transform matrix for  $N=4$ . (3)
4. Write about KL transform. (2)
5. Draw the model of image degradation process. (2)
6. Differentiate spatial and frequency domain filtering. (3)
7. What is the need for compression? (3)
8. Define compression ratio. (2)
9. What is chain code? (2)
10. What is thresholding? (3)

**PART-B (50 Marks)**

11. (a) With neat diagrams explain the elements of visual perception. (6)  
 (b) Explain the basic relationships between pixels. (4)
12. (a) Obtain the slant transform matrix for  $N=4$ . (6)  
 (b) State and prove any two properties of 2D fourier transform. (4)
13. (a) Explain spatial filtering in image enhancement. (6)  
 (b) Discuss high boost filtering. (4)
14. (a) Explain about error free compression. (6)  
 (b) Write about transform based compression. (4)
15. (a) Explain point, line and edge detection. (6)  
 (b) Write about water shed algorithm. (4)
16. (a) What are the applications of digital image processing? Explain how a digital image is formed. (6)  
 (b) Write about elements of digital image processing system. (4)
17. (a) Write about histogram processing. (6)  
 (b) Explain bit plane slicing. (4)

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**FACULTY OF ENGINEERING****B.E. 4/4(ECE)I-Semester (New) (Main)Examination, Dec, 2017****Subject : Artificial Neural Networks (Elective-I)****Time : 3 hours****Max. Marks : 75****Note : Answer all questions from Part-A and any Five Questions from part-B****PART – A**

1. Contrast Biological Neuron with Artificial Neuron model. [3]
2. Define "Training" and classify them. [3]
3. Write any two basic learning laws. [2]
4. Distinguish between Activation and Synaptic dynamic models. [2]
5. List the requirements of Learning Laws. [2]
6. Write a short notes on STM and LTM. [3]
7. What is Interpolative Neural Network? [2]
8. What is Perceptron Neural Network solution for XOR problem? [3]
9. Briefly explain Linear Auto-Associative feed forward and feed backward Neural Networks. [2]
10. With a neat diagram, explain the ADALINE Neuron model. [3]

**PART – B**

11. a) Explain in detail the topology, applications and limitations of McCulloch-Pitts Neuron model. [6]  
b) Implement 'AND' logic gate using McCulloch-Pitts Neuron model. [4]
12. Derive & Explain the additive activation model in detail. [10]
13. a) Explain in detail pattern association task with example. [5]  
b) Explain in detail pattern storage task with example. [5]
14. State and prove perceptron convergence theorem. [10]
15. Explain in detail Back Propagation Neural Network with its Topology, training Algorithm, features, limitations and extensions. [10]
16. With a neat diagram , explain the Hopfield Neural Network, its capacity and energy function. [10]
17. Explain with a neat diagram Boltzmann machine, its training algorithm and limitations. [10]

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I-Semester (Old) Examination, December 2017****Subject: Optical fiber Communication (Elective – I)****Time: 3 Hours****Max. Marks: 75****Note:** Answer All Questions From Part – A, any FIVE Questions From Part - B.**PART-A [25 Marks]**

1. List the elements of Optical Fiber Transmission Link (2)
2. What is numerical aperture and write its significance (3)
3. Compare between step index and graded index fibers (2)
4. Define birefringence (2)
5. What is pulse broadening in guided index fibers (2)
6. Compare direct and indirect band gap semiconductors (3)
7. Define a lambertian pattern (2)
8. Differentiate between analog optical receiver and digital optical receiver (3)
9. A GaAs optical source with a refractive index of 3.6 is coupled to a silica fiber has a refractive index of 1.48. If the fiber end and the source are in close physical contact. Estimate the Fresnel reflection coefficient and power coupled to a silica fiber. (3)
10. What is the difference between again guided laser diode and index guided laser diode? (3)

**PART-B [50 Marks]**

11. a) With a neat block diagram, explain the operation of an optical fiber transmission link. (7)
- b) Discuss about Mode Field Diameter with reference to single mode fibers. (3)
12. Explain the material dispersion, waveguide dispersion and derive the expression for both using EMF theory. (10)
13. a) Discuss about resonant equation. (5)
- b) Discuss about power launching and coupling. (5)
14. a) Explain about the operation of an APD. (5)
- b) Explain fusion slicing method with neat sketch. (5)
- 15 a) Derive an expression for different noise sources in an optical receiver. (10)
16. What is rise time budget? Derive an expression for total rise time or total system rise time. (10)
17. Write short notes on:
  - a) Fiber to Fiber joints
  - b) Wavelength Division Multiplexing. (10)

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**FACULTY OF ENGINEERING**

B.E. 4/4 (ECE) I-Semester (Old ) Examination, December 2017

Subject: Dental Image Processing (Elective – I)

Time: 3 Hours

Max. Marks: 75

**Note: Answer All Questions From Part–A any FIVE Questions From Part-B****PART-A (25 Marks)**

- 1 What is Mach Band effect? (2)
- 2 If the object distance is +400mm, Locate the image created by a lens with focal length  $f=+200\text{mm}$ . (3)
- 3 What is zooming and shrinking of an Image? (2)
- 4 What are the advantages of wiener filter over inverse filter? (3)
- 5 What is contrast stretching? (2)
- 6 Mention the properties and disadvantages of K-L transform? (3)
- 7 Calculate the Entropy of the image. (3)

5	10	15	15
10	15	20	20
20	20	25	30
25	25	30	30

- 8 What is Bit plane slicing? Mention its applications? (2)
- 9 Differentiate Image Enhancement and Image Restoration? (3)
- 10 What is Sequency? Give the sequency of DFT for  $N=4$ ? (2)

**PART-B**

11. a) What is Digital Image processing? Draw the block diagram and explain the various fundamental steps involved in Digital Image processing? (6)
- b) Image transmission is done in packets. A packet consists of a start bit, a byte of data and a stop bit. (4)
  - (i) How many minutes would it take to transmit a  $512 \times 512$  image with 256 grey levels at baud rate. (4)
  - (ii) What would be the time at 9600 baud rate? (4)
12. a) Show that 1-D DCT can be implemented via N-point FFT. (5)
- b) Obtain the Haar transform matrix for  $N=4$ . (5)
13. (a) Discuss smoothing spatial filters ? What is ringing effect? (6)
- (b) Bring out the differences between spatial domain and frequency domain image enhancement approaches (4)

- 14.a) With the help of block diagram, explain the Homomorphic filtering approach for Image enhancement. What are the advantages of these filters? (5)
- b) Define Histogram? Perform Histogram equalization on the given segment of Image? (5)

10	11	12	11	10
12	12	13	5	4
13	12	5	3	5
13	12	4	3	5
12	4	5	4	4

- 15 a) Explain Image restoration of degraded images by Weiner filtering? (5)
- b) What is Salt and pepper noise? How it can be removed explain in detail with an example (5)
- 16 a) Define Redundancy? Explain various types of Redundancies? (5)
- b) Given a four symbol source **{a,b,c,d}** with source probabilities **{0.1,0.4,0.3,0.2}** arithmetically encode the sequence **b b a d c** (5)
17. Write short notes on (10)
- Discuss various adjancies in an Image
  - Lossless predictive coding
  - Pixel replication

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**FACULTY OF ENGINEERING**

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

**Subject : Automobile Engineering**

**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 Classify the vehicles on the basis of different aspects.
- 2 Give the different parts of piston and its functions.
- 3 Compare air cooling verses liquid cooling.
- 4 Mention types of ignition systems.
- 5 Name different types of steering gear boxes.
- 6 Draw the steering system components.
- 7 What is the purpose of clutch?
- 8 Write the advantages and disadvantages of hydraulic brakes.
- 9 Describe servicing procedures in brief.
- 10 Write EURO norms.

**PART – B (50 Marks)**

- 11 (a) Differentiate between integral and semi-integral frame.  
(b) With the help of sketch explain operating mechanism of valves.
- 12 (a) Explain wet sump lubrication system.  
(b) How battery system differ from magneto system?
- 13 (a) Explain about radiator cooling system in IC engines.  
(b) List the advantages and disadvantages of tubeless and tubed tyres
- 14 (a) Explain the following terms with the help of diagrams: (i) Caster, (ii) Camber  
(b) Draw a line diagram of a steering linkage for independent front suspension type vehicle.
- 15 (a) Write the Ackerman's principle of steering. Show with the help of a diagram when vehicle takes a right turn.  
(b) Write short notes on : (i) Vacuum brakes (ii) Electrical brakes, and (iii) Air brakes
- 16 (a) What is the function of an universal joint? Where it is used in the transmission system of an automobile.  
(b) What is the function of propeller shaft? How it is connected in the transmission system?
- 17 (a) Explain features of catalytic converter and its functions  
(b) Explain about Bharat norms

**FACULTY OF ENGINEERING**

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

**Subject : Non-Conventional Energy Sources (Elective-I)**

**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 What are the prospects of non-conventional energy sources in India?
- 2 How solar radiation is measured?
- 3 How solar collectors are classified?
- 4 What is the principle of wind turbine?
- 5 How are WEC systems classified?
- 6 Write applications of wind energy.
- 7 Write the sketch of a precast – RCC – Biogas – Manure plant.
- 8 What are the problems facing commercial development of OTEC systems?
- 9 What are the limitations of wave energy conversion?
- 10 What are the main types of OTEC power plant?

**PART – B (50 Marks)**

- 11 Classify the methods of solar energy storage. Describe thermal energy storage systems.
- 12 Prove that in case of horizontal axis wind turbine maximum power can be obtained when:  
Exit velocity =  $1/3$  wind velocity
- 13 Write down the methods of ocean thermal electronic power generation with sketches.
- 14 Explain how classification of Biomass gasifiers are made. Describe the chemistry of the gastification process.
- 15 What is community Biogas plant? What are the main problems encountered in its operations?
- 16 Write notes on the following:
  - (a) Give a list of the materials used for Biogas generation
  - (b) Give a brief note on the prospects of geothermal energy
- 17 (a) Describe a binary cycle system for liquid dominated geothermal energy system.  
What are the main types of turbines used?
  - (b) Discuss about the Status of multiple products OTEC systems.

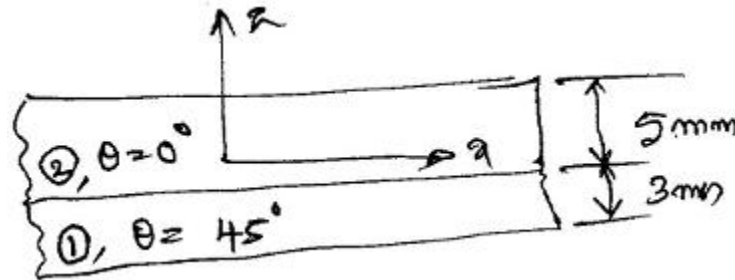
**FACULTY OF ENGINEERING****B.E. 4/4 (M/P/AE) I – Semester (Main & Backlog) Examination, December 2017****Subject: Composite Materials (Elective – I)****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A. Answer any five questions from Part B.****PART – A (25 Marks)**

- 1 How composites are classified? 3
- 2 What are carbon-carbon composites? What are the advantages? 2
- 3 What do you mean by interlaminar shear properties? Write an expression for apparent interlaminar shear strength. 3
- 4 Define gel time. 2
- 5 What are the assumptions made in the strength of materials approach? 2
- 6 Find the transverse youngs modulus of a glass / epoxy lamin with a 70% fiber volume fraction.  
 $E_f = 85 \text{ GPa}; E_m = 3.4 \text{ GPa}$  3
- 7 Distinguish between symmetric cross-ply laminates and symmetric angle ply laminates. 2
- 8 Define interlaminar stresses with causes. 3
- 9 What is maximum stress failure theory? 3
- 10 What is the significance of interactions failure theories of failure? 2

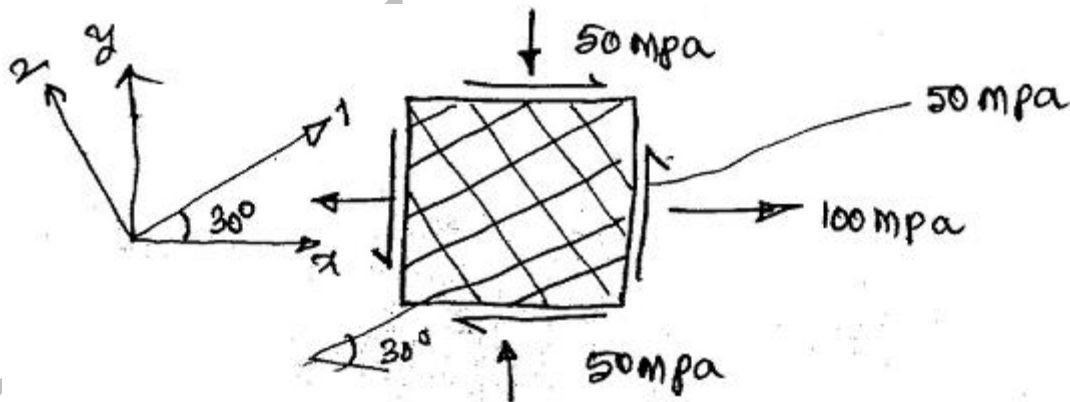
**PART – B (5x10 = 50 Marks)**

- 11 a) What are metal matrix composites? State their advantages. 5  
b) Give the description of graphite fibers. 5
- 12 With the neat diagram explain pultrusion. State advantages and disadvantages. 10
- 13 a) Derive an expression for major Poisson's ratio using mom approach. 5  
b) Find the major and minor Poisson's ratio of a glass / epoxy lamina with 70% fiber volume fraction  
 $\epsilon_f = 0.2; \epsilon_m = 0.3; E_f = 85 \text{ GPa}; E_m = 3.4 \text{ GPa}$  5

- 14 A laminate constituted of two unidirectional layers is as shown. The unidirectional composite material of the two layers is a glass fiber epoxy, with  $E_1 = 46$  GPa;  $E_2 = 10$  GPa;  $G_{12} = 4.6$  GPa;  $\nu_{12} = 0.31$ . Determine A, B, D matrices. 10



- 15 An orthotropic balanced lamina element is under the state of stress as shown. Using the maximum strain criterion, determine whether or not failure will occur. 10



$$E_1 = E_2 = 70 \text{ GPa};$$

$$F_{1t} = F_{1c} = F_{2c} = F_{2t} = 560 \text{ MPa};$$

$$\nu_{12} = \nu_{21} = 0.25;$$

$$F_{12} = 25 \text{ MPa};$$

$$G_{12} = 5 \text{ GPa}$$

- 16 a) Write the Halpin-Isai equations for transverse modulus, explaining each term clearly. 5  
 b) Differentiate between anisotropic, orthotropic and isotropic materials in terms of elastic constants. 5
- 17 a) State the assumptions made in mom approach. 5  
 b) State the assumptions made in Classical Lamination Theory (CLT). 5

**FACULTY OF ENGINEERING****B.E. 4/4 (Prod.) I – Semester (Main & Backlog) Examination, December 2017****Subject: Total Quality Management (Elective – I)****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A. Answer any five questions from Part B.****PART – A (10x2.5 = 25 Marks)**

- 1 What is quality policy?
- 2 What is Theory X and Y?
- 3 What is DFMA?
- 4 Define failure rate.
- 5 Explain variable charts.
- 6 What is chi square test?
- 7 Explain AQL and LTPD.
- 8 Define AOQL.
- 9 What are the parameter to measure customer satisfaction?
- 10 Define JIT.

**PART – B (5x10 = 50 Marks)**

- |  |   |
|--|---|
| 11 a) Explain Maslow need theory.                                  | 4 |
| b) Explain OC curve.   | 6 |
| 12 a) Explain quality function deployment.                         | 5 |
| b) Explain FMEA.   | 5 |
| 13 a) Explain ANOVA.   | 5 |
| b) Explain Taguchi method.   | 5 |
| 14 a) Explain features of QIS software.                            | 5 |
| b) Explain non destructive testing.                                | 5 |
| 15 a) What are the problems with the customer satisfaction system? | 5 |
| b) What are the difficulties in implementing TQM system?           | 5 |
| 16 a) Explain flexibility in manufacturing.                        | 5 |
| b) Explain design for experiments.                                 | 5 |
| 17 Write short notes on:   |   |
| a) Methods of evaluating supplier products                         | 5 |
| b) The concept of POKA YOKE.                                       | 5 |

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**FACULTY OF ENGINEERING**

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

**Sub: Production and Operations Management (Elective – I)**

**Time: 3 Hours**

**Max.Marks: 75**

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

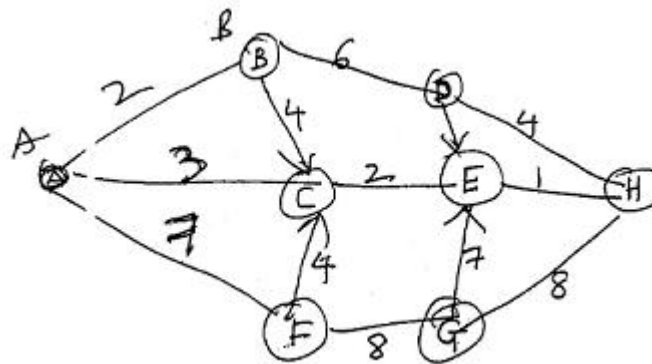
**PART – A (25 Marks)**

- 1 Describe job shop.
- 2 Give specimen of a product layout.
- 3 What is meant by product life cycle?
- 4 Briefly write about work sampling.
- 5 Write the functions of served by MRP.
- 6 What is aggregate planning?
- 7 What are the objectives of inventory controls?
- 8 Mention some differences between PERT and CPM.
- 9 What are the areas of applications of network techniques?
- 10 What are the considerations borne in mind in time-estimation while planning a project actuals.

**PART – B (5x10 = 50 Marks)**

- 11 a) Differentiate between process layout and product layout with the help of a neat figure.  
b) Explain characteristics of good wage system.
- 12 a) Write about qualitative models.  
b) Explain different forecasting errors and its advantages.
- 13 a) Explain master scheduling methods with graphs.  
b) Explain MRP1 and MRP2 with respect to type of job order production.
- 14 a) Explain production model with shortages.  
b) Explain derivation of basic EOQ model.
- 15 a) Explain Fulkerson's rule in project management.  
b) Explain the procedure for determining the critical path in the project network.

- 16 a) By means of a graph explain the quantity cost relationship in inventory.
- b) ABC Corporation has got a demand for particular part at 10,000 units per year. The cost per unit is Rs.2, and it costs Rs. 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9% of average inventory investment. Determine.
- 17 a) What is the procedure for determining the critical path? What is the significance of PERT?
- b)



Determine the critical path of the network.

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) I – Semester (Main & Backlog) Examination, December 2017****Subject: Mobile Computing (Elective – I)****Time: 3 Hours****Max.Marks: 75**

**Note: 1. Answer all questions from Part A & any five questions from Part B.  
2. Missing data, if any, may be suitably assumed.**

**PART – A (25 Marks)**

- |    |   |   |
|----|---|---|
| 1  | List the classification of Antenna along with its usage.  | 3 |
| 2  | Write the applications of medium access control protocol. | 2 |
| 3  | What is localization? Give an example.                    | 3 |
| 4  | Give the different types of handover in GSM.              | 2 |
| 5  | Compare the features of Infra red and radio transmission. | 3 |
| 6  | Write the classification of Routing protocols.            | 2 |
| 7  | What is DHCP? Write its application.                      | 3 |
| 8  | Write about Palm OS.                                      | 2 |
| 9  | Differentiate between WAP1.X and WAP 2.X.                 | 3 |
| 10 | What is MANET?  | 2 |

**PART – B (50 Marks)**

- |    |   |    |
|----|---|----|
| 11 | a) Compare SDMA / TDMA / FXMA / CDMA.                                   | 5  |
|    | b) Define spread spectrum and differentiate between DHSS and FHSS.      | 5  |
| 12 | Discuss with the help of a diagram the system architecture of GSM.      | 10 |
| 13 | Discuss the protocol stack of blue tooth with the help of a diagram.    | 10 |
| 14 | a) Write about any three classical TCP improvements.                    | 5  |
|    | b) Discuss any two topology based routing protocols in MANETS.          | 5  |
| 15 | What is WWW? Discuss the architecture of Wireless Application protocol. | 10 |
| 16 | a) Write in detail about any four modulation techniques.                | 6  |
|    | b) Write about Digital Audio Broadcasting.                              | 4  |
| 17 | Write short notes on the following:                                     |    |
|    | a) MAC Physical layer   | 3  |
|    | b) HYPERLAN   | 4  |
|    | c) Mobile Transport Layer   | 3  |

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) I – Semester (Main & Backlog) Examination, December 2017****Subject: Software Project Management (Elective – I)****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 What do you mean by project management? What is its need? Give any one formal definitions of project management. (3)
- 2 List any three necessary improvements that can make waterfall model work in modern software development? (3)
- 3 What do you mean by "Round Trip Engineering". (2)
- 4 What is Iterative Process Planning? (2)
- 5 List the various types of contracts and describe the various stages in awarding a contract. (2)
- 6 What is leadership and how can you measure leadership styles? (2)
- 7 How do you calculate effort in terms of personnel, environment, quality, size, and process? (3)
- 8 How is a software project different from a conventional engineering project? (3)
- 9 Differentiate between metaprocess, macroprocess, and microprocess. (2)
- 10 What is ISO? How is it different from CMM? (3)

**PART – B (5x10 = 50 Marks)**

- 11 a) List and explain the five necessary improvements to the waterfall model proposed by Winston Royce. (5)  
b) Discuss any five metrics proposed by Barry Boehm related to conventional software management performance. (5)
- 12 a) Discuss the five important aspects (areas of development) of Software Economics. (5)  
b) List any five risks involved in the conventional process. (5)

- 13 a) Discuss the primary objectives, and essential activities of Inception and Elaboration Phase. (5)
- b) Discuss the concept of the following engineering artifacts:
- i) Vision Document
  - ii) Architecture Description. (5)
- 14 a) Discuss the important aspects of software architecture from the perspective of management. (5)
- b) List and explain the seven top-level workflows of a software process. (5)
- 15 a) Describe the roles and responsibilities of software architecture team and software management team. (5)
- b) Discuss the concept of Round-Trip Engineering with the help of a diagram. (5)
- 16 a) Discuss the minor milestones in the life cycle of an iteration. (5)
- b) List and briefly explain the five levels of CMM. (5)
- 17 a) List the seven core metrics and describe the purpose of each metric. (5)
- b) Discuss the concept, purpose and five distinct processes in ISO 12207. (5)

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I-Semester (Main) Examination, December 2017****Subject : Grid Computing (Elective-III)****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 Distinguish between Grid Computing and Cloud Computing.              | 2 |
| 2 What are the functions of Resource Home?                             | 2 |
| 3 Distinguish between MPI_Send() and MPI_SSend() functions of MPI API. | 3 |
| 4 What are the responsibilities of Resource Broker?                    | 3 |
| 5 What is WS-Resource? How is it addressed?                            | 3 |
| 6 Write briefly about GSI communication protocols.                     | 3 |
| 7 What is Grid Nexus?  | 2 |
| 8 What is parameter sweep application? Give examples.                  | 3 |
| 9 What is File staging?  | 2 |
| 10 Define Grid Enabling.   | 2 |

**PART – B (50 Marks)**

- |   |        |
|---|--------|
| 11 Explain briefly various concepts of grid computing. What are various application of Grid computing.                                    | 10     |
| 12 What is Meta-Scheduler? Explain how scheduling is carried in Grid Computing with Grid way and Condor-G.                                | 10     |
| 13 Explain the meaning of stateful service with illustrations. Explain how the state is realized using WSRF standard.                     | 10     |
| 14 Explain the working of the following API calls of MPI.<br>i) MPI_Bcast()    ii) MPI_Scatter()    iii) MPI_Gather()    iv) MPI_Reduce() | 10     |
| 15 What is Globus Toolkit? Explain the interaction among the components of Globus Toolkit.  | 10     |
| 16 Distinguish between the three output modes of globusrun-ws: Interactive, Interactive streaming and Batch. Give examples.               | 10     |
| 17 Write short notes on the following :<br>a) gLite<br>b) Service-Oriented Architecture   | 5<br>5 |