

## FACULTY OF ENGINEERING

**B.E. 4/4 (Civil) I - Semester (Suppl.) Examination, May / June 2017**

**Subject : Pre-Stressed Concrete  
(Elective – I)**

**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 Distinguish between shrinkage and creep of concrete.
- 2 How do you compute the loss of pre stress due to wobble effect.
- 3 What is load balancing concept.
- 4 What is Thermo Elastic prestressing.
- 5 List out the different losses which occur in the pre-tensioned and post tensioned members.
- 6 Explain the term minimum pre stressing force.
- 7 Explain concentric and eccentric tendons.
- 8 What is an end block
- 9 Explain the importance of end block.
- 10 What do you mean by concordant cable profile ?

### PART – B (50 Marks)

11. What are the assumptions made in pre stressed concrete. Discuss in detail different pre-tensioning and post-tensioning methods and advantages of each method with neat sketches.
12. A post tensioned concrete beam 200 mm wide and 400mm deep is pre-stressed by four cables each with a cross-sectional area of  $80\text{mm}^2$  with an initial stress of  $1200\text{N/mm}^2$ . All the four cables are straight and located at 120mm from the soft it of the beam. If the modular ratio is 6 calculate the loss of pre-stress in the four cables due to elastic deformation of concrete for only of the following cases :
  - a) Simultaneous tensioning and anchoring of cables.
  - b) Successive tensioning of four cables one at a time.
13. A concrete beam 100mm wide and 300mm deep is pre-stressed by a parabolic cable carrying an effective stress of 120Mpa. The beam is simply supported over an effective span of 8m. the cable compound by 6 wires of 7 mm diameter, has an eccentricity of 75mm at the centre and zero at the supports. Assume  $E_c=35\text{Gpa}$ . Neglecting all losses find central deflection of beam under :
  - a) Self weight + pre-stress.
  - b) Self weight + pre-stres + LL of 20KN/m throughout.

14. What are the advantages of end-blocks ? Explain in detail step wise procedure for Guyon's design methods ?
15. A post-tensioned cable of a beam 10m long is initially tensioned to a stress of  $1000 \text{ N/mm}^2$  at one end. If the tendons are curved so that the slope is 1 in 15 at each end with an area of  $600 \text{ mm}^2$ , calculate the loss of pre-stress due to friction given the following data :

Coefficient of friction between duct and cable = 0.55

Friction coefficient for wave effect = 0.0015/m

During anchoring, if there is a slip of 3mm at jacking end, calculate the final force in the cable and percentage loss of pre-stress due to friction and Slip.

16. A PSC T-beam has a flange 1000mm wide and 200mm thick. The web is 200 mm thick and 1000 mm deep. At a particular section the beam is subjected to an ultimate moment and shear force of 2000 KN-m and 250KN respectively. Calculate the flexure shear resistance and design suitable shear reinforcement at the section using the following data :

Effective depth = 1100 mm

Cube strength of concrete = 40 MPa

Effective pre-stress at the extreme tensile face of beam =  $19.3 \text{ N/mm}^2$ .

Second moment of area of cross section =  $7.533 \times 10^{10} \text{ mm}^4$

Area of pre-stressing steel =  $2310 \text{ mm}^2$

Tensile strength of tendons =  $1500 \text{ N/mm}^2$

Effective stress in tendons after all losses =  $900 \text{ N/mm}^2$

17. Write short notes on the following :
- Cracked and un-cracked sections.
  - Design of continuous beams according to IS specifications.

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**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I – Semester (Suppl.) Examination, May / June 2017****Subject: Geographical Information Systems  
(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 Briefly discuss how different geographic features are represented on a map. 3
- 2 Describe with examples the various data types used in GIS. 3
- 3 What is SQL and how is it used to retrieve data from a database? 3
- 4 List the various data formats used in GIS. 2
- 5 What is the necessity of data compression in GIS and list the commonly used compression algorithms. 2
- 6 Define spatial analysis. 2
- 7 Explain briefly transformation, conflation and edge matching. 3
- 8 Describe briefly the various types of output from GIS software. 3
- 9 Define remote sensing and draw the diagram depicting the interaction of radiation with Earth's surface features. 2
- 10 Define active and passive remote sensing with examples of active and passive sensors. 2

**PART – B (5x10 = 50 Marks)**

- 11 a) Describe the history of development of GIS along with a list of standard GIS packages. 5
- b) Describe how GIS can be used to make decisions under uncertainty. 5
- 12 a) Explain the object structural model in GIS. 5
- b) What is Digital Elevation Data and illustrate its use in GIS with the help of an example. 5
- 13 a) Differentiate between Vector Data Analysis and Raster Data Analysis. 5
- b) Describe the maintenance and analysis of non-spatial attribute data in GIS. 5
- 14 a) What is meant by map transformation and list the main map transformations being used. 5
- b) Explain the classification of GIS. 5
- 15 a) What are the various components of data quality in GIS. 5
- b) Define error and describe the various types of errors in GIS along with recommendations to overcome these errors. 5

- 16 a) Describe cartographic modeling with the help of an example. 5  
b) Briefly describe the various text patterns, line styles and graphic symbols used in GIS. 5
- 17 a) Briefly describe the data products of remote sensing and methods of interpretation of this data. 5  
b) Explain how GIS software can be used for visibility analysis. 5

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**FACULTY OF ENGINEERING****B.E. 4/4 (CE/EE/Inst./M/P) I – Semester (Suppl.) Examination, May / June 2017****Subject : Entrepreneurship  
(Elective – I)****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and answer any five questions from Part-B.****PART – A (10x2 ½ = 25 Marks)**

- 1 What are basic characteristics of entrepreneur.
- 2 What are methods of training suitable for entrepreneur. .
- 3 State the features of PERT network management.
- 4 Explain the role of looping and dangling activities in project network.
- 5 Give the project activities – construct the network.

Activity	A	B	C	D	E	F	G	H
Predessor	--	A	A	B	B,C	E	D,F	G

- 6 What is break-even point in production planning.
- 7 What are the attributes of entrepreneur.
- 8 What are urgency factors of the Entrepreneur.
- 9 What are simple forecasting techniques for product.
- 10 What are factors deciding the choice of technology selection for entrepreneur.

**PART – B (10x5=50 Marks)**

- 11 (a) Explain the Government policy towards entrepreneurship skilled manpower. (5)
- (b) Explain the opportunities available for women in rural areas. (5)
- 12 (a) What are the techniques of evaluation of new product ideas for entrepreneurs. (5)
- (b) Explain how the linkage between small and medium – heavy industries for successful operation entrepreneurship. (5)
- 13 (a) How entrepreneurs should do market analysis and its demand for a new product or innovated product for project formulation. (5)
- (b) Explain the institutions for project financing in India for small and medium scale entrepreneurs. (5)

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- 14 Construct the network and find the critical path of the network and find total slack activities. (10)

Activity	A	B	C	D	E	F	G	H	i	J	K
Duration	13	8	10	9	11	10	8	6	7	14	18
Predecessor	--	A	B	C	B	E	D,F	E	H	G,I	J

- 15 (a) Explain different types of personality models and their attributes. (8)  
 (b) Explain various approaches of Time Management. (2)
- 16 (a) Find the critical path of the network and find total slack activities. (5)

Activity	A	B	C	D	E	F	G	H	i	J	K	L	M	N	O
Duration	2	2	4	6	1	1	3	5	10	7	6	2	2	1	2
Immediate Predecessor	--	--	--	B	B	A,E	C,D	G	H	I	C,D	C,D	C,D	J	M

- (b) Explain various aspects of Projection formulation. (5)
- 17 (a) Explain the Leadership model suitable for small scale industry. (5)  
 (b) Find the critical path of the network and find total slack activities. (5)

Activity	A	B	C	D	E	F	G	H
Duration	4	5	6	3	2	4	1	2
Immediate Predecessor	--	--	--	A	B	C	D,E	F,G

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**FACULTY OF ENGINEERING****B.E. 4/4 (EEE) I - Semester (Suppl.) Examination, May / June 2017****Subject : HVDC Transmission (Elective-I)****Time : 3 Hours****Max. Marks: 75**

**Note: Answer all questions from Part-A and answer any five questions from Part-B.  
Missing data, if any may be suitably assumed.**

**PART – A (25 Marks)**

- 1 Draw neat diagram of a homopolar link and explain its working. (3)
- 2 Compare power per conductor in DC link with that of power per conductor in AC line. (2)
- 3 Find peak to peak ripple in 3 phase bridge rectifier. (3)
- 4 Define pulse number. (2)
- 5 Draw combined characteristics of rectified and inverter and explain operation of DC link. (2)
- 6 What are the limitations of manual control? (3)
- 7 Define "Arcback failure". (3)
- 8 Explain briefly the working of Bypass valve. (2)
- 9 Distinguish between characteristic and uncharacteristic harmonics. (3)
- 10 Draw a typical MTDC system. (2)

**PART – B (50 Marks)**

- 11 (a) Draw the schematic diagram of a typical HVDC converter station with 2 six pulse converter units and explain the functions of each component.  
(b) What are the different types of HVDC link used?
- 12 Three phase HVDC bridge converter is operating with firing angle " $\alpha$ " and overlap angle " $\mu$ "  
(a) Obtain the expression for average dc voltage of converter terminals.  
(b) Find the approximate expression for power factor on the ac side of converter  
(c) Sketch the instantaneous dc voltage waveform in inversion mode.
- 13 (a) Describe the Individual Phase Control and Equidistant Pulse Control scheme for firing angle control employed in a converter.  
(b) Explain the hierarchy of control schemes used for DC link.
- 14 (a) Discuss the relative features of different reactive power control schemes in HVAC and HVDC systems.  
(b) Give in detail the different sources of reactive power.
- 15 (a) Explain the conventional control strategy employed in HVDC systems.  
(b) Briefly explain about AC filters.
- 16 (a) Deduce and explain AC/DC load flow equation problem using the sequential method.  
(b) Mention the configuration and impedance characteristics of various types of filters. Give design aspects of single tuned filter.
- 17 Write short notes on the following:
  - (a) Misfiring
  - (b) Telephone Influence Factor

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**FACULTY OF ENGINEERING**  
**B.E. 4/4 (EEE) I - Semester (Suppl.) Examination, May / June 2017**

**Subject : Power Quality (Elective-I)**

**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 following terms: (3)  
 (a) Voltage fluctuations (b) Transients (c) Spikes
- 2 What are the sources of harmonics ? (3)
- 3 What are the different types of Sags? (3)
- 4 What are the effects of momentary voltage dips on synchronous motors? (3)
- 5 How ASD system effects power quality? (3)
- 6 What are the guidelines for limiting harmonics? (2)
- 7 How is Voltage sag characterized ? Give an example. (2)
- 8 What are the power quality monitoring devices? (2)
- 9 Define THD and give its equation. (2)
- 10 Define voltage swell. (2)

**PART – B (50 Marks)**

- 11 (a) How do you assess the power quality data? Explain how to create PQ database. (5)  
 (b) List out the power quality problems and explain in detail. (5)
- 12 Explain the analysis of sag magnitude in (10)  
 (a) Non-Radial system and (b) Meshed systems
- 13 (a) Explain the effect of harmonics on transformers. (5)  
 (b) Give the different methods for evaluation of harmonic levels in industrial systems. (5)
- 14 (a) What are ASDs? Explain the effect of voltage sag on DC drive system. (5)  
 (b) Explain the assessment of voltage sag by a power quality meter. Explain the accuracy of the PQ meter in computing the voltage sag. (5)
- 15 What is the impact of harmonics on capacitor Bank in a distribution system explain in detail? (10)
- 16 (a) Explain the operation of Flicker meter with block diagram. (5)  
 (b) Explain the requirements of transducers and its applications. (5)
- 17 Write short notes on the following: (5)  
 (a) Voltage tolerance curves (5)  
 (b) Waveform Distortion (5)



**FACULTY OF ENGINEERING****B.E. 4/4 (Inst.) I - Semester (Suppl.) Examination, May / June 2017****Subject : Automation in Process Control (Elective – I)****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 What are different cable used for interfacing a PC to sensor? (2)
- 2 What are the guidelines to be 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 different layers of OSI? (2)
- 7 Explain computer control of liquid level system. (2)
- 8 Give the flow sheet of Plastic injection moulding process. (3)
- 9 What are smart sensors? Give the advantages of using it. (3)
- 10 What is a HART protocol? (2)

**PART – B (50 Marks)**

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

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**FACULTY OF ENGINEERING**  
**B.E. 4/4 (ECE) I - Semester (Suppl.) Examination, May / June 2017**

**Subject : Optical Fiber Communication (Elective – I)**

**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 advantages of optical fiber communication.
- 2 Describe different optical fibre types.
- 3 Explain cutoff wave length and numerical aperture.
- 4 With a diagram, explain construction of LED and define quantum efficiency.
- 5 Describe micro bending losses and scattering losses.
- 6 With a block diagram explain fibre optic communication system.
- 7 Explain modulation methods used in optical communication systems.
- 8 Describe simple optical receiver.
- 9 Explain opto-mechanical switching.
- 10 Mention components required in link design.

**PART – B (50 Marks)**

- 11 (a) Describe single mode fibres and their advantages.  
(b) Explain fibre losses and their principle causes.
- 12 (a) Describe signal distortion in optical wave guide.  
(b) Obtain wave equation from Maxwell equation.
- 13 (a) Explain the difference between (i) Step index and (ii) Graded index fibres  
(b) Describe couplers and connectors with diagram.
- 14 (a) Explain detectors used in optical receiver.  
(b) Describe with diagram opto-electronic integrated devices.
- 15 (a) With a neat diagram explain optical fibre link.  
(b) Explain wavelength multiplexing.
- 16 (a) Describe Optical time division multiplexing.  
(b) List out different types of pre-amplifier and explain them.
- 17 Write short notes on the following:
  - (a) Polarized modes
  - (b) PIN diode construction and working
  - (c) APD diodes

**FACULTY OF ENGINEERING**  
**B.E. 4/4 (ECE) I - Semester (Suppl.) Examination, May / June 2017**

**Subject : Digital Image Processing (Elective – I)**

**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 sampling and quantization. (2)
- 2 Define 4-neighbor and 8-neighbor of a pixel. (2)
- 3 Explain the separability property of a 2D Fourier transform. (3)
- 4 Write the 2D Hadamard transform [Forward and Inverse]. (3)
- 5 What is unsharp Masking? (2)
- 6 Is there any advantage of frequency domain filter over spatial domain filters?  
If so why? (3)
- 7 Mention the drawbacks of inverse filtering. (2)
- 8 List out the typical degradation sources. (3)
- 9 Mention the limitations of Huffman coding. (2)
- 10 Compare Lossy and Lossless compression. (3)

**PART – B (50 Marks)**

- 11 (a) Explain the importance of Brightness Adaptation and discrimination in image processing. (5)  
(b) Describe in detail about the basic elements of Digital image processing. (5)
- 12 (a) Find DCT transform for the given 2x2 image [3 6 ; 6 4]. (5)  
(b) Obtain the Haar Transform matrix for N = 8. (5)
- 13 (a) With the help of block diagram, explain homomorphic filtering. (5)  
(b) Explain the procedure for histogram equalization. (5)
- 14 (a) What is meant by image restoration? Explain the model of image degradation. (4)  
(b) Describe constrained least square filtering for image restoration and derive its transfer function. (6)
- 15 A source emits letters from an alphabet  $A = \{a_1, a_2, a_3, a_4, a_5\}$  with probabilities  $P(a_1)=0.2, P(a_2)=0.4, P(a_3)=0.2, P(a_4)=0.1, P(a_5)=0.1$ . (10)
- 16 (a) A source emits 3 symbols ABC with probability (0.5, 0.25, 0.25) respectively, construct an Arithmetic code to encode the word 'CAB'. (6)  
(b) Explain how smoothing is achieved in the frequency domain. (4)
- 17 Write short notes on the following:  
(a) Hotelling  
(b) Speckle noise

**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I – Semester (Suppl.) Examination, May/June 2017****Sub: Embedded 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 Define Embedded System. List any two examples of embedded systems. (3M)
- 2 Name the classifications of embedded systems with an example for each. (2M)
- 3 List the various interrupt sources of ARM & its corresponding addresses. (3M)
- 4 Differentiate among RISC Vs CISC CPU. (2M)
- 5 What are CAN versions and its throughput? Justify its unique importance compared with other serial protocols. (3M)
- 6 Differentiate host Vs target. (2M)
- 7 What is the full form of SPI? Mention its advantages and disadvantages. (3M)
- 8 Mention any two important points for configuring Ethernet over IP? (2M)
- 9 List any two CPUs which are used in designing embedded systems. Mention the compilers used to program these CPUs. (3M)
- 10 Mention the advantage of Logic Analyzer. Differentiate the timing mode Vs State mode in logic analyzer. (2M)

**PART – B (5X10 = 50 Marks)**

- 11 a) Summarize the important design challenges that need to be considered while designing an embedded system product. (5M)
  - b) With a block diagram, explain the basic building blocks of a typical Embedded System. Differentiate Embedded Hardware Vs Software. (5M)
- 12 a) With a neat diagram, draw the ARM CPU core architecture and explain how barrel shifter is responsible in achieving pipelining. (5M)
  - b) What is thumb mode? Explain its importance. Mention how to swing from ARM to thumb mode and vice versa. (5M)
- 13 a) Write in detail about I2C protocol working principle. Mention the different frame formats of I2C. List the different states that an I2C node may enter. (5M)
  - b) What is the full form of PCI? What is its importance & throughput? Justify its need in embedded system networking. (5M)

- 14 a) Define Hardware Software co-design. With a neat flowchart explain the various stages of hardware and software co-design process. (5M)
- b) Write a short note on Linker, Loader & Locator. Differentiate among the Intel Vs Motorola mode opted by a locator for writing a program into flash. (5M)
- 15 a) Define Debugging. Write in detail about different hardware and software methods for debugging an embedded application. (6M)
- b) Write a short note on JTAG and its need for embedded systems. (4M)
- 16 a) List various challenges involved for making a standalone embedded system to be connected with the network over TCP/IP. (5M)
- b) Write a short note on embedded in circuit emulator (Embedded ICE). (5M)
- 17 Answer any **two** of the following:
- a) ARM Register Organization & Concept of mode specific banked registers. (5M)
- b) USB topology and its importance in embedded networking. (5M)
- c) Host – Target communication block diagram and its importance. (5M)

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## FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I – Semester (Suppl.) Examination, May / June 2017

Sub: System Automation and Control (Elective – I)

Time: 3 Hours

Max.Marks: 75

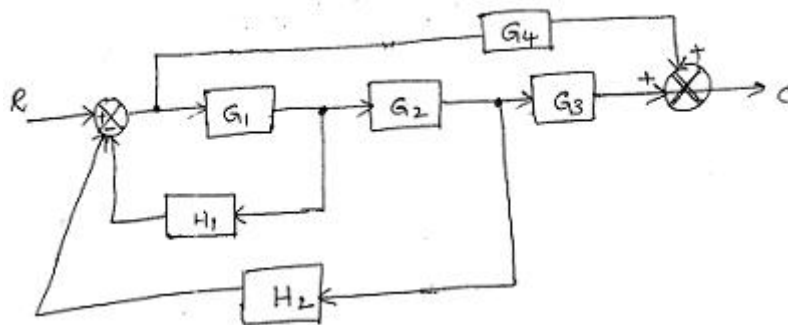
**Note: Answer all questions from Part – A and any five questions from Part – B.**

### PART – A (25 Marks)

- |   |   |
|---|---|
| 1 List out the uses of pneumatic sensor.  | 2 |
| 2 Describe briefly the criterion for the selection of sensor.                             | 3 |
| 3 What are the various sources of errors in DAC?  | 3 |
| 4 List out various signal conditioning modules.   | 2 |
| 5 Distinguish between the electromechanical and hydraulic-mechanical engineering systems. | 3 |
| 6 List out the building blocks of mechanical system.                                      | 2 |
| 7 Define transfer function of a system.   | 2 |
| 8 Explain briefly the selection criterion of a PLC.                                       | 3 |
| 9 List out the components of a motion control system.                                     | 2 |
| 10 Describe the importance of feedback device in motion control.                          | 3 |

### PART – B (5x10 = 50 Marks)

- |   |   |
|---|---|
| 11 a) What are the performance deciding factors of sensors? Explain them. | 6 |
| b) Explain the operation and give an example of temperature sensor.       | 4 |
| 12 a) Explain the process of analog to digital conversion.                | 5 |
| b) What are the different types of DACs? Explain any one DAC in detail.   | 5 |
| 13 a) Find the transfer function of a given block diagram by reducing it. | 7 |



- |   |   |
|---|---|
| b) Describe the importance of a mathematical model. | 3 |
|---|---|

- 14 a) Describe the basic building blocks of a microcontroller. 5  
b) Write a short note on programmable logic controllers. 5
- 15 Explain integral control, with the help of circuit diagram and suitable waveforms. 10
- 16 a) Describe the criteria to choose suitable data acquisition equipment. 5  
b) What are the real world applications of motion control system? 5
- 17 Write short notes on:  
a) Motion Input / Output. 5  
b) Thermal system building blocks. 5

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**FACULTY OF ENGINEERING****B.E. 4/4 (M / P) I – Semester (Suppl.) Examination, May / June 2017****Subject: Automobile Engineering (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 Write the advantages and disadvantages of using hydrogen in automobiles.
- 2 Why aluminium alloy is used widely as piston material?
- 3 What is an oil sump? How oil level is measured?
- 4 Why cold weather starting is difficult?
- 5 What are the functions of the suspension system?
- 6 Define caster angle. How does caster help to produce directional stability?
- 7 What is the principle on which hydraulic brakes work?
- 8 What is the purpose of the pressure plate in the clutch?
- 9 Name the main pollutants in the engine exhaust.
- 10 What is overhauling?

**PART – B (5x10 = 50 Marks)**

- 11 a) What is chassis? What are components of a chassis? Indicate their functions. 5  
b) Sketch and explain the construction and operation of simple carburetor. 5
- 12 a) With the help of neat sketch explain wet sump lubrication system. 5  
b) Describe with diagram, the operation of the battery ignition system. 5
- 13 a) Sketch the sectional view of the tyre and indicate its various parts. 5  
b) With the help of neat sketch explain the working of recirculating ball type steering gear. 5
- 14 a) With the help of a neat sketch explain the construction and operation of the hydraulic brake system. 5  
b) With the help of neat sketch explain the construction and operation of a sliding meshing gear box. 5
- 15 a) What is closed crank case ventilation? Discuss in detail the two types of crank case ventilation systems used in automobiles. 5  
b) Describe how proper design of combustion chamber helps to reduce exhaust emission. 5
- 16 a) With the help of neat sketch explain the construction of the universal coupling. 5  
b) What are possible clutch troubles and their main causes? 5
- 17 Write a note on the following: 10  
a) Pollution control  
b) Shock absorber  
c) Petroil systems.



**FACULTY OF ENGINEERING****B.E. 4/4 (Mech.) I – Semester (Suppl.) Examination, May / June 2017****Subject: Non-Conventional Energy Sources (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 Why it is called renewable sources of energy?
- 2 What is criteria for assessing the potential of wind energy.
- 3 How can amount of solar radiations falling on an tilted flat surface be estimated?
- 4 What is photon energy?
- 5 Explain the terms 'lift' and 'drag' in wind turbine.
- 6 Write the classifications of wind turbines.
- 7 Name the biomass conversion technologies for different end applications.
- 8 What are the different sources of geothermal energy?
- 9 What is ocean wave energy?
- 10 What are the limitations of OTEC plants?

**PART – B (5x10 = 50 Marks)**

- 11 Write the demerits in the use of renewable sources of energy?
- 12 Give a step-by-step procedure for the design of a solar photovoltaic power plant.
- 13 Determine the rotor diameter for a wind power plant of 1 MW rated output. The design wind speed is 12 m/s, the turbine power coefficient is 0.43 and projected annual duration of utilization is 2400 hours per year. Also calculate the turbine power density at the design speed, annual power generation and torque experienced by the rotor at a speed of 50/sec (may be 50 rev/sec). The air density at 20°C is 1.205 kg/m<sup>3</sup>.
- 14 Discuss different systems used for generating the power using geothermal energy.
- 15 Explain with the help of schematic diagrams of
  - a) Hydraulic accumulator wave machine
  - b) High-level reservoir wave machine
- 16 What factors are considered for selecting a suitable site for tidal power plants?
- 17 The following data may be used for the design of a solar water heater.
 

Solar radiation = 5 kWh/m <sup>2</sup> /day	Hot water required = 1000 kg/day
Hot water temperature = 45°C	Cold water temperature = 14°C
C <sub>p</sub> <sub>w</sub> = 1.163 Wh/Kg-K	Mean efficiency of water heater = 48%

 Piping and storage heat losses may be neglected. If a single plant has an area of 2.2 m<sup>2</sup>, find out the total area required and number of solar collector modules.

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**FACULTY OF ENGINEERING**

**B.E. 4/4 (Mech.) I – Semester (Suppl.) Examination, May / June 2017**

**Subject: Tool Design (Elective-I)**

**Time: 3 Hours**

**Max.Marks: 75**

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

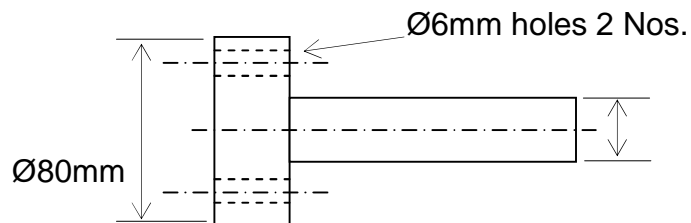
**PART – A (25 Marks)**

- 1 What are the major constituents of the cutting tool material? Explain.
- 2 State the advantages and applications of EBM.
- 3 Differentiate between single point and multi point cutting tools.
- 4 Sketch and mention the elements of a pull broach.
- 5 Describe various types of shanks for drills.
- 6 Sketch the reamer and explain its elements.
- 7 What do you mean by Reaming allowance? Explain.
- 8 Suggest materials for the manufacturing Taps and Dies.
- 9 Explain the principle involved in magnetic clamps.
- 10 Which type of fixture is suitable for turning operations?

**PART – B (5x10 = 50 Marks)**

- 11 a) Discuss the significance of Unconventional machining.  
b) Explain principle involved in AJM with a neat sketch
- 12 a) Sketch a Face Milling Cutter and explain the elements.  
b) Discuss the procedure involved in designing of a push type broacher.
- 13 a) Draw a neat sketch of Twist drill and indicate various elements.  
b) How the angles of a twist drill affect the torque and thrust forces? Explain.
- 14 a) Discuss the effect of thread relief and chamfer angle on the design of a tap.  
b) Give a detailed note on plastic die.
- 15 a) Sketch and design a piercing die for making 30 mm diameter part from 1.5mm thick alloy steel .  
b) Sketch and indicate various elements of a Blanking die

16 a) Design and draw a drill jig to make a hole of 6 mm on the component shown below:



Assume missing data.

17 Write short notes on the following:

- Honing process
- Die set elements.
- Grinding jigs.

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**FACULTY OF ENGINEERING**  
**B.E. 4/4 (CSE) I - Semester (Suppl.) Examination, May / June 2017**

**Subject : Image Processing (Elective – I)**

**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 What is a bit plane? (2)
- 2 List properties of Discrete Fourier Transform. (2)
- 3 Explain the concept of spatial filtering. (2)
- 4 Define optical illusion and mach band. (3)
- 5 What is the function of Gaussian high pass filter? (2)
- 6 Define Histogram Equalization. (2)
- 7 Explain Image subtraction and averaging. (3)
- 8 What is line and Edge Detection? (3)
- 9 Why segmentation is required in image processing? (3)
- 10 Mention the limitation of Huffman Coding. (3)

**PART – B (50 Marks)**

- 11 What are the stages through which an image passes in an image processing system? Explain each stage in detail. (10)
- 12 Explain Discrete Cosine Transform and its applications in image processing. (10)
- 13 What is meant by Smoothing and sharpening filters? Explain various smoothing and sharpening filters in spatial domain. (10)
- 14 Explain the image enhancement process in frequency domain. (10)
- 15 Explain Inverse filtering and Wiener filtering. (10)
- 16 Describe different image compression standards and compare its performance. (10)
- 17 (a) What is image segmentation? What are the applications of image segmentation? (5)  
(b) State and prove convolution property of 2D-FFT. (5)

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) I - Semester (Suppl.) Examination, May / June 2017****Subject : Software Project Management (Elective – I)****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 What are the basic parameters of cost models? How effort is calculated? (3)
- 2 Draw a diagram of predominant cost estimation model. (2)
- 3 Write the phases of life cycle process. (3)
- 4 What is the proof of stable architecture? (3)
- 5 What is MTBF and how is it calculated? (2)
- 6 What do you mean by program management? (2)
- 7 Name any two major improvements in next generation software cost estimation models. (2)
- 8 Give the classification of CASE tools for process activities. (3)
- 9 Write three different aspects of an architecture from management prospective. (3)
- 10 Distinguish between iteration and increment. (2)

**PART – B (50 Marks)**

- 11 List and briefly explain the seven top level workflows of a process. Name any two artifacts related to each work flow. (10)
- 12 What are the various phases of modern software process? Explain briefly each phase. (10)
- 13 Explain the following:
  - (a) Role and Responsibilities of project manager (5)
  - (b) List and explain top five management principles. (5)
- 14 List the top ten software metrics by Bohem and how does the modern software management process address each one of them. (10)
- 15 Explain in detail the life cycle process of ISO 12207. (10)
- 16 Explain the following:
  - (a) Effect of team size on key process primitives. (5)
  - (b) Purpose and components of SPCP. (5)
- 17 (a) Explain the importance of Software Project Management. (6)
- (b) How the effectiveness of Software Project is measured? (4)

**FACULTY OF ENGINEERING**  
**B.E. 4/4 (CSE) I - Semester (Suppl.) Examination, May / June 2017**

**Subject : Mobile Computing (Elective – I)**

**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 Write about a Cellular Network. (2)
- 2 Draw MSK for the bit stream 1 0 1 0 0 1 0. (3)
- 3 Write the basics of Satellite systems. (3)
- 4 What is Localization? (2)
- 5 Differentiate Adhoc and Infrastructure Networks. (2)
- 6 Explain the functionalities of Link Manager of Bluetooth. (3)
- 7 What is DHCP? State its functionality. (2)
- 8 List various applications of Mobile Adhoc Networks. (3)
- 9 Differentiate WAP 1.x and 2.x. (3)
- 10 Enlist the features of Symbian Operating system. (2)

**PART – B (50 Marks)**

- 11 (a) What is Multiplexing? Discuss different types of Multiplexing. (5)  
 (b) What is Spread spectrum? Write about the techniques used to spread a spectrum. (5)
- 12 Describe the functional Architecture of GSM system, with the help of a diagram. (10)
- 13 Explain Bluetooth security block diagram. (10)
- 14 Discuss Tunneling and Encapsulation mechanisms of Mobile IP. (10)
- 15 Discuss in detail Protocol Architecture for WAP. (10)
- 16 (a) Explain briefly about TETRA frame structure. (5)  
 (b) Compare and contrast Traditional TCP and classical TCP. (5)
- 17 Write short notes on the following: (10)
  - (a) HIPERLAN
  - (b) DVB
  - (c) Piles Systems

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**FACULTY OF INFORMATICS**

**B.E. 4/4 (IT) I – Semester (Suppl.) Examination, May / June 2017**

**Sub: Digital Image Processing (Elective – III)**

**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 Define brightness and contrast of an image. [2]
- 2 Define geometric mean filtering. [3]
- 3 What is the use of MPEG standard? [2]
- 4 What do you infer from multi-modal histogram of an image? [3]
- 5 State the condition to be met by the partitions in region based segmentation. [3]
- 6 State the principle of directional smoothing. [3]
- 7 Write the importance of edge detection. [2]
- 8 Explain about the role of Discrete Cosine Transform role in JPEG image compression. [2]
- 9 Explain what is the basic concept in the segmentation method by morphological watersheds. [3]
- 10 Describe the shape numbers of an image. [2]

**PART – B (5x10=50)**

- 11 Determine the Discrete Cosine Transform (DCT) for  $N=8$ . [10]
- 12 Discuss the image segmentation based on various thresholding techniques. [10]
- 13 a) Explain the 2D-DCT with its properties. [5]  
b) Explain the colour image enhancement. [5]
- 14 Give the butterfly diagram of Cooley-Tukey method of computing Discrete Fourier Transform (DFT) of a 8-point data-set. Also explain the role of roots of unity in developing this algorithm known as Fast Fourier Transform (FFT). [10]
- 15 a) Write notes on region splitting and merging. [5]  
b) What is directional derivative and where it is used in image processing? [5]

- 16 a) How the RGB model is represented using HSI format? Describe the transformation. [5]
- b) How do you enhance a monochrome image with equalization of histogram. [5]
- 17 a) Discuss region growing. [5]
- b) Explain how to remove the blur caused in an image due to uniform linear motion. [5]

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I-Semester (Supplementary) Examination, May / June 2017****Subject : Software Reuse Techniques (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  | List the basic principles to achieve systematic software reuse.                        | 3 |
| 2  | What is a façade?  | 2 |
| 3  | Differentiate structural and behavioural patterns.                                     | 3 |
| 4  | How do design patterns solve the design problems?                                      | 3 |
| 5  | When can you apply proxy pattern?  | 2 |
| 6  | What is command pattern?   | 2 |
| 7  | Draw the structure of state pattern and mention the participants of the state pattern. | 3 |
| 8  | What is the model-view-controller architectural pattern?                               | 3 |
| 9  | What are the benefits of Mediator pattern?   | 2 |
| 10 | Who are the most important actors within the reuse business?                           | 2 |

**PART – B (50 Marks)**

- |    |  |    |
|----|--|----|
| 11 | a) Characterize use-case components with respect to reusability.                                       | 5  |
|    | b) Discuss any one application in detail which uses OOSE principles.                                   | 5  |
| 12 | Describe the intent, motivation, applicability and participants of                                     |    |
|    | i) Singleton pattern   | 5  |
|    | ii) Decorator pattern  | 5  |
| 13 | a) Describe the intent, motivation and applicability of bridge pattern.                                | 5  |
|    | b) Explain the consequences and implementation of Interpreter pattern.                                 | 5  |
| 14 | Explain how architectural patterns are different from creational, structural and behavioural patterns. | 10 |
| 15 | Write short notes on :   |    |
|    | a) Black board pattern   | 5  |
|    | b) Layers pattern  | 5  |
| 16 | Explain in detail the essential steps of the component system engineering process.                     | 10 |
| 17 | a) Explain briefly about publisher-subscriber design pattern.  | 5  |
|    | b) Explain how whole-part hierarchies are represented with underlying structure.                       | 5  |

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**FACULTY OF INFORMATICS**

**B.E. 4/4 (IT) I-Semester (Supplementary) Examination, May / June 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 Differentiate between Enterprise grid and Partner Grid. 2
- 2 What are the components of job submission? 3
- 3 Explain the need for advance Reservation. 2
- 4 Discuss the problems in public key cryptography. 3
- 5 Draw the events sequence in service oriented architecture. 3
- 6 What the characteristics of Workflow editor? 2
- 7 Discuss the need for data partitioning. 3
- 8 Define the term parameter sweep. 2
- 9 Differentiate between GT3 and GT4. 3
- 10 What is MPI-scatter? 2

**PART – B (50 Marks)**

- 11 Discuss about various file transferring methods. 10
- 12 What the need for Delegation? Write about proxy certification. 10
- 13 Explain Open Grid Services Architecture (with a neat diagram). 10
- 14 Write about the process of Grid Enabled MPI. 10
- 15 How is Logging and Book keeping done in gLite? 10
- 16 Write short notes on any two : 10
  - a) Features of Scheduler
  - b) Stateless and stateful web services
  - c) Campus Grids
- 17 a) Explain about Sun Grid Engine. 5
  - b) Discuss the role of Certificating Authority. 5

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I - Semester (Suppl.) Examination, May / June 2017****Subject : Semantic Web (Elective – III)****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 What is Syntactic Web? (2)
- 2 Draw the architecture of Semantic Web. (2)
- 3 Write about reduction to unsatisfiability. (3)
- 4 How do you represent an RDF statement? (3)
- 5 Define OWL Lite, OWL DL, OWL Full. (3)
- 6 Exemplify the declaration of Individuals in OWL Lite. (3)
- 7 What constitutes UDDI registry? (2)
- 8 Mention the benefits of Web Service technology. (2)
- 9 List the attributes of Software agents. (2)
- 10 What is WordNet? (3)

**PART – B (50 Marks)**

- 11 Differentiate between Taxonomies, Thesaurus and Ontologies. (10)
- 12 Discuss about the family of attributive languages. (10)
- 13 Explain in brief about Semantic Web Rule Languages. (10)
- 14 Describe Uschold and King Ontology Development method. (10)
- 15 In detail explain Suggested Upper Merged Ontology (SUMO). (10)
- 16 Write short notes on :
  - (a) Datalog (5)
  - (b) Web Services Security Standards (5)
- 17 Describe in brief about the following:
  - (a) Themes related to Semantic Web (5)
  - (b) Summarize RDF Scheme Vocabulary (5)

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