

**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I – Semester (Main) Examination, December 2015****Subject: Pre-Stressed Concrete (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 is the basic principle of prestressed concrete.
- 2 Give the deflection equation for a sloping tendon.
- 3 Give any two advantages of continuous beams.
- 4 List out the different losses that occur in pre-tensioned and post-tensioned members.
- 5 Sketch the typical tensile stress distribution in an end block of a PSC beam with a single anchorage.
- 6 Define reinforcement ratio.
- 7 What are the advantages of Guyon's method?
- 8 Explain how shear and flexure cracks develop in a section.
- 9 List out the assumptions made in elastic theory of flexure.
- 10 List out the factors influencing deflection.

**PART – B (5x10 = 50 Marks)**

- 11 Explain the need of high strength steel and concrete in prestressing technique. Also explain the advantages of pre stressed concrete in detail.
- 12 The cross-section of a PSC beam over a span of 6m is 100mm wide and 300mm deep. The initial stress in the tendon located at a constant eccentricity of 50mm is  $1000\text{N/mm}^2$ . The sectional area of the tendon is  $1000\text{mm}^2$ . Find the percentage increase in wires when the beam supports a live load of  $4\text{KN/m}$ . The density of concrete is  $24\text{KN/m}^3$ ,  $E_c = 36\text{KN/mm}^2$ ,  $E_t = 21036\text{KN/mm}^2$ .
- 13 A rectangular concrete beam 300mm wide and 350mm deep is prestressed by a force of  $650\text{KN}$  at a constant eccentricity of 60mm. The beam supports a concentrated load of  $75\text{KN}$  the centre of the span of 4m. Determine the location of the pressure line at the centre, quarter span and support sections of the beam. Neglect self-weight of the beam.
- 14 What are the advantages of stress distribution in end blocks? Write the design procedure for Guyon's method.
- 15 A pre-tensioned beam 250mm wide and 300mm deep is prestressed by 12 wires each of 7mm diameter initially stressed to  $1200\text{N/mm}^2$  with their centroids located 100mm from soffit. Estimate the final percentage loss of stress due to elastic deformation, creep, shrinkage and relaxation using the following data: relaxation of stress in steel =  $90\text{N/mm}^2$ ,  $E_s = 2.10 \times 10^5 \text{ N/mm}^2$ ,  $E_c = 0.35 \times 10^5 \text{ N/mm}^2$ , creep coefficient ( $\phi_{CC}$ ) = 1.6, Residual shrinkage strain =  $3 \times 10^{-4}$ .

- 16 A pre-stressed beam having a rectangular cross-section with a width of 120 mm and a depth of 300 mm is continuous over two spans,  $AB=BC=8$  M. The cable with zero eccentricity at the ends and an eccentricity of 50 mm towards the top fibres of the beam over the central support carries an effective force of 500KN.
- Calculate the secondary moments developed at B
  - Locate the position of the pressure line at the quarter span and at mid-section of span AB.
- 17 Write short notes on the following:
- Load balancing concept.
  - Shear resistance of un-cracked sections.
  - Deflections in PSC beams.

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OU - 1607 OU - 1607

**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I – Semester (Main) Examination, December 2015****Subject: Operation Research (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 State the objectives Operation Research.
- 2 Define a) Redundant constraint, b) Unbounded solution
- 3 Why 'Dual' is necessary in LPP?
- 4 Examine the conditions to be satisfied for an LPP to be solved by Dual Simplex.
- 5 How do you proceed to solve a TP problem if the given case is maximization and unbalanced state?
- 6 Why a TP problem can be solved as assignment problem?
- 7 List the assumptions of Replacement policy.
- 8 Explain Kendall's notation in queuing theory.
- 9 Define the person zero sum game and also saddle point.
- 10 What are single and multl objective optimization techniques?

**PART – B (5x10 = 50 Marks)**

- 11 Use simplex method to solve the following problem.  
 Maximization  $z = 6x_1 - 7x_2$   
 subject to
 
$$\begin{array}{rcl} 2x_1 + 4x_2 & 12 \\ 4x_1 + 4x_2 & 8 \\ x_1, x_2 & 0 \end{array}$$
- 12 Use dual simplex method to solve the following LP problem.  
 Maximization  $z = -3x_1 - x_2$   
 subject to
 
$$\begin{array}{rcl} x_1 + x_2 & 1 \\ 2x_1 + 3x_2 & 2 \\ x_1, x_2 & 0 \end{array}$$
- 13 Given the following profit matrix, assign the sales engineer to various zones to maximize profit.

		Zones			
		A	B	C	D
Sales Engineer	P	140	112	98	154
	Q	90	72	63	99
	R	110	88	77	121
	S	80	64	56	88

14 Solve the following Transportation problem.

		Destination				Supply
		P	Q	R	S	
Source	A	21	16	25	13	11
	B	17	18	14	23	13
	C	32	17	18	41	19
	Demand	6	10	12	15	43

15 a) What are types of games?

b) The cost of a machine is Rs. 61,000 and its scrap value is Rs. 1000. The maintenance costs found from past experience are as follows:

Year	1	2	3	4	5	6	7	8
Maintenance cost in Rupees	1000	2500	4000	6000	9000	12000	16000	20000

When should machine be replaced?

16 a) Define traffic intensity in queuing theory.

b) A petrol station has two pumps. The service time follow the exponential distribution with mean 4 minutes and cars arrive for service in a poisson process at the rate of 10 cars per hour. Find the probability that a customer has to wait for services. What proportion of time the pump remains idle.

17 State the demerit of sequencing of jobs of graphical method. State the assumptions of sequencing. What is the criterion followed in selecting the best sequencing based on multiple or alternate optimum solution? Apply Jhonsons algorithm to following problem.

Jobs	A	B	C	D	E
Machine A	5	6	8	10	7
Machine B	5	8	6	7	10

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**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I – Semester (Main) Examination, December 2015****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  | List out the applications of GIS.                         | 3 |
| 2  | Discuss the common coordinate system in spatial data.     | 2 |
| 3  | Differentiate between 'datum' and 'spheroid'.             | 2 |
| 4  | Explain the concept of Thematic Mapping.                  | 2 |
| 5  | What is meant by adjacency, containment and connectivity? | 3 |
| 6  | Distinguish between data acquisition and data analysis.   | 3 |
| 7  | Explain Structural Query Language (SQL).                  | 3 |
| 8  | What are the different output functions?                  | 2 |
| 9  | Briefly explain about the overlay analysis.               | 3 |
| 10 | Define Remote Sensing.                                    | 2 |

**PART – B (5x10 = 50 Marks)**

- |    |   |    |
|----|---|----|
| 11 | a) Explain various types of projections used in GIS.                          | 7  |
|    | b) Explain the concept of map analysis.                                       | 3  |
| 12 | a) What do you mean by Digital Elevation Data and Data compression?           | 5  |
|    | b) Define Data Acquisition, Data Interaction and Data Processing.             | 5  |
| 13 | a) Explain the role of DBMS in GIS.   | 5  |
|    | b) What are the requirements of a good digitizer?                             | 5  |
| 14 | a) What are the different types of errors in GIS? Discuss with neat sketches. | 5  |
|    | b) Differentiate between Raster data analysis and Vector data analysis.       | 5  |
| 15 | a) Discuss about different output functions used in GIS.                      | 5  |
|    | b) Briefly explain Edge Matching and Editing.                                 | 5  |
| 16 | a) Explain the use of spectral reflectance curves in Remote Sensing.          | 5  |
|    | b) Briefly explain the Supervised and Unsupervised Image classification.      | 5  |
| 17 | Write short notes on the following:   | 10 |
|    | a) Overlay analysis   |    |
|    | b) Differentiate between Rayleigh scattering and Mie scattering.              |    |
|    | c) Differentiate between GIS and GPS.   |    |

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**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I – Semester (Main) Examination, December 2015****Subject: Entrepreneurship  
(Common to all except CSE/AE/IT) (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 the definition of Entrepreneur?
- 2 What are the qualities of successful entrepreneur?
- 3 What is a project life cycle?
- 4 State the features of CPM network in project management.
- 5 Explain the role of allowance and slack activities in the project network.
- 6 Given the project activities – construct the network.

Activity	A	B	C	D	E	F	G	H	I	J
Predecessor	--	A	B	B	B	C	C	F,G	D,E,H	I

- 7 What is the role of break-even chart in production planning?
- 8 Explain the role of time management in entrepreneurial activities.
- 9 State the classification of industries based on the capital investment as per Government of India norms.
- 10 What are different agencies help in export promotion of SSI products.

**PART – B (5x10 = 50 Marks)**

- 11 a) Explain the organization of different forms of enterprises. 5  
b) Explain of role of entrepreneurs in economic growth of economy with respect to social empowerment. 5
- 12 a) Explain the role of women entrepreneurship in the economic growth of the country especially India with respect to societal background. 5  
b) Explain the choice of technology selection with respect to today entrepreneurs. 5
- 13 a) What is technical analysis for project formulation for new product or innovated product? 5  
b) Explain the financial and profitability analysis of projection formulation. 5
- 14 Construct the project network and find (a) Critical path, (b) Float – (free and total) for non-critical activities. 10

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M
Predecessor	--	A	B	A	D	E	--	G	J,H	--	A	C,K	I,L
Duration	6	4	7	2	4	10	2	10	6	13	9	3	3

- 15 a) Explain how a entrepreneur should be motivated for high performance. 5  
b) Explain the time management matrix of entrepreneur. 5

- 16 a) Explain the sources of ideas for an entrepreneur. 5  
 b) Construct the network and find the critical path of the project. 5

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

- 17 a) Explain how an entrepreneur faces competition and challenges. 5  
 b) Construct the project critical path of the network and calculate the earliest and latest starting and finishing time for each activity and calculate float (Free and total) for non-critical activities. 5

Activity	1-2	2-3	3-4	2-4	4-5	2-5	5-8	5-6	6-8	5-7	7-8	8-9	9-10
Name	A	B	C	D	E	F	G	H	I	J	K	L	M
Duration	2	4	10	4	10	5	36	12	4	12	8	6	12

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**FACULTY OF ENGINEERING****B.E. 4/4 (EEE) I – Semester (Main) Examination, December 2015****Subject: HVDC Transmission (Elective – I)****Time: 3 Hours****Max.Marks: 75**

- Note:** i) Answer all questions from Part A. Answer any five questions from Part B.  
 ii) Answers to the questions of Part-a must be at one place and in the same order as they occur in the question paper.  
 iii) Missing data, if any may be suitably assumed.

**PART – A (25 Marks)**

- 1 If "P" is the power transferred in d.c. as well as in a.c. Explain which system is more economical. 2
- 2 "The voltage drop due to commutation in HVDC converters depends upon firing angle? State true or false and justify. 3
- 3 "The chances of commutation failures are more in case of inverters in comparison to rectifiers". Justify. 3
- 4 For a 12 pulse converter, what type of A.C filters would you employ at converter Bus? 2
- 5 What is current margin? Mention its significance. 2
- 6 Name the causes of commutation failure in converter. 3
- 7 Define harmonic instability. 3
- 8 What is a Bypass valve? Give its normal mode of operation. 2
- 9 "Point to point DC transmission does not need any DC circuit breaker". State true or false and justify. 3
- 10 Mention the desired features of control. 2

**PART – B (5x10 = 50 Marks)**

- 11 Compare the HVDC transmission and HVAC transmission with reference to following factors:  
 a) Economics                      b) Technical performance                      c) Reliability
- 12 With the help of a neat schematic diagram, explain the operation of three phase, sine pulse, Graetz's circuit when operating with a firing angle of  $\alpha = 30^\circ$ . Neglect the reactance of the converter transformer. Draw the following wave forms to scale when working as a rectifier:  
 i) Output DC voltage              ii) Value currents                      iii) Voltage across valves.  
 Hence, estimate the average DC voltage on the output side.
- 13 a) Compare constant voltage and constant current control of HVDC converters.  
 b) With a neat block diagram, explain the working of CEA controller.
- 14 a) Describe the various types of reactive power sources used in HVDC transmission.  
 b) Discuss in detail the operation of static VAR compensators.
- 15 a) Explain about the conventional control strategy employed in HVDC systems.  
 b) Give some of the differences between simultaneous and sequential method.
- 16 a) Name the different faults in a HVDC system.  
 b) What are the different protection schemes employed for overcoming those faults?
- 17 a) Why harmonics are generated in HVDC converter?  
 b) Mention the problems associated with the harmonics. Suggest some remedial measures.



**FACULTY OF ENGINEERING****B.E. 4/4 (EEE) I – Semester (Main) Examination, December 2015****Subject: Power Quality (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 is the purpose of PQ database?                 | 2 |
| 2  | What are the power quality determination causes?    | 3 |
| 3  | Define harmonics.                                   | 2 |
| 4  | What are PQ standards?                              | 3 |
| 5  | Define phase angle jump and voltage swell.          | 2 |
| 6  | What is an ASD system?                              | 3 |
| 7  | What are different types of sags?                   | 3 |
| 8  | What are PQ monitoring devices?                     | 2 |
| 9  | What are guidelines for limiting voltage harmonics? | 3 |
| 10 | Define interruption.                                | 2 |

**PART – B (5x10 = 50 Marks)**

- |    |  |    |
|----|--|----|
| 11 | Discuss the following related to PQ problems.  | 10 |
|    | i) Data collection and analysis  |    |
|    | ii) Database structure   |    |
|    | iii) Data processing   |    |
|    | iv) Data monitoring  |    |
| 12 | a) Mention the methodology for computation of voltage sag magnitude and occurrence.            | 7  |
|    | b) Causes of voltage sag.  | 3  |
| 13 | a) Using block diagram approach discuss the operation of AC and DC drivers.                    | 8  |
|    | b) What are the effects of sag on ASD?   | 2  |
| 14 | a) Give different methods for evaluation of harmonic levels in industrial distribution system. | 7  |
|    | b) List out the guidelines for limiting voltage harmonics.                                     | 3  |
| 15 | What are PQ monitoring devices and explain in detail.  | 10 |
| 16 | a) What are sources of voltage sags and causes and remedies of it?                             |    |
|    | b) IEC electromagnetic compatibility standards.  |    |
| 17 | a) Define  |    |
|    | i) Harmonics   |    |
|    | ii) Interruption   |    |
|    | iii) Sag   |    |
|    | iv) Swell  |    |
|    | b) Explain PQ issues in detail   |    |

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**FACULTY OF ENGINEERING****B.E. 4/4 (EEE / Inst.) I – Semester (Main) Examination, December 2015****Subject: Embedded 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  | What is domain specific embedded system?                 | 2 |
| 2  | Mention the challenges in embedded system design.        | 3 |
| 3  | Draw the basic embedded processor.                       | 3 |
| 4  | Mention the differences between CISC and RISC processor. | 2 |
| 5  | Mention the embedded control application.                | 2 |
| 6  | Mention the steps in programming in embedded C.          | 3 |
| 7  | What is RTOS?  | 2 |
| 8  | What are the issues related to embedded control?         | 3 |
| 9  | Mention the basic function boundary scan.                | 3 |
| 10 | What are the Simulators and Emulators?                   | 2 |

**PART – B (5x10 = 50 Marks)**

- |    |   |        |
|----|---|--------|
| 11 | Explain in detail the characteristics and quality attributes of embedded system. Give the details with suitable examples. | 10     |
| 12 | Explain the Harvard architecture microcontroller with neat diagram. Describe briefly each instruction set.                | 10     |
| 13 | Explain in detail Network-based embedded applications with neat diagram. What are its applications?                       | 10     |
| 14 | a) What are OS-II & Vx works? Give them in detail.<br>b) What is the CPU performance issue in embedded system?            | 5<br>5 |
| 15 | a) Explain briefly cross compilation.<br>b) Explain with neat diagram different phases and approaches of EDLC.            | 5<br>5 |
| 16 | a) Write short notes on DSP Processors.<br>b) What is programming modeling concept in detail.                             | 5<br>5 |
| 17 | Write short notes on the following:<br>a) Trends in Embedded industry<br>b) Target Hardware Debugging<br>c) ARM           | 10     |

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**FACULTY OF ENGINEERING****B.E. 4/4 (Inst.) I – Semester (Main) Examination, December 2015****Subject: Automation in Process Control (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  | Draw the P&I diagram of computerized level control system.                   | 3 |
| 2  | Draw the block diagram of DAS.   | 3 |
| 3  | What are the different types of display systems in DCS?                      | 2 |
| 4  | What is HMI? Explain with an example.  | 2 |
| 5  | What is the difference between SCADA-RTU and DCS-LCU?                        | 3 |
| 6  | What are the applications of SCADA systems?                                  | 2 |
| 7  | What is device description language?   | 3 |
| 8  | What are the advantages of EMR's over SSR's?                                 | 2 |
| 9  | What are smart sensors and how are they different from sensors?              | 2 |
| 10 | What is a field bus and enumerate different types of industrial field buses? | 3 |

**PART – B (5x10 = 50 Marks)**

- |    |   |    |
|----|---|----|
| 11 | With a neat diagram explain data distribution system and interfacing the input signals in process control automation. | 10 |
| 12 | Draw the block diagram of DDC system and explain systematically.  | 10 |
| 13 | Explain the computer control of online optimization of distillation column with a neat diagram.                       | 10 |
| 14 | Draw the block diagram of hierarchical stages of DCS system and explain.  | 10 |
| 15 | Discuss DCS hardware configuration and its advantages over mainframe DDC and conventional control.                    | 10 |
| 16 | With a neat diagram explain the operation of smart differential pressure transmitter.                                 | 10 |
| 17 | Write short notes on:<br>a) SCADA hardware<br>b) HART protocol.   | 10 |

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I - Semester (Main) Examination, December 2015****Subject : Optical Fiber Communication (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 is the necessity of cladding for an optical fiber?          | 2 |
| 2  | Compare step index and graded index fibers.                      | 3 |
| 3  | Briefly explain basic attenuation mechanism in an optical fiber. | 2 |
| 4  | Explain core-cladding losses.                                    | 3 |
| 5  | Define quantum efficiency.                                       | 2 |
| 6  | What are the advantages and disadvantages of LED?                | 3 |
| 7  | Explain avalanche multiplication.                                | 2 |
| 8  | Compare pin photodiode and avalanche photodiode.                 | 3 |
| 9  | What is Wavelength Division Multiplexing (WDM).                  | 2 |
| 10 | Mention few noises that affects the system performance.          | 3 |

**PART – B (50 Marks)**

- |       |  |   |
|-------|--|---|
| 11 a) | What is V-number? Show that the number of modes in step index fiber is given by $M = V^2/2$ .  | 7 |
| b)    | Define acceptance angle and numerical aperture of the fiber.                                   | 3 |
| 12 a) | Explain material dispersion and obtain an expression for the rms value of material dispersion. | 6 |
| b)    | Explain bending losses.  | 4 |
| 13 a) | Explain the operation of an edge emitting LED.   | 6 |
| b)    | Write a note on fiber to fiber joints.   | 4 |
| 14 a) | What are pre-amplifiers? Describe the different types of pre-amplifiers.                       | 6 |
| b)    | Draw a simple model of a photodetector receiver and explain its working.                       | 4 |
| 15 a) | Discuss the point to point fiber optic link and its characteristics.                           | 6 |
| b)    | Give an account on SONET/SDH.  | 4 |
| 16 a) | Draw the erbium doped amplifier circuit and explain its working.                               | 6 |
| b)    | Discuss the different mechanisms involved to produce laser emission.                           | 4 |
| 17    | Write short notes on :   |   |
| a)    | Evolution of fiber optic system  | 3 |
| b)    | Rise time budget   | 4 |
| c)    | Power launching and coupling   | 3 |

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**FACULTY OF ENGINEERING**

B.E. 4/4 (ECE) I - Semester (Main) Examination, December 2015

Subject : Digital Image Processing (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 do you mean by connectivity of pixels? 2
- 2 Define translating, scaling and rotation transform used in image processing. 3
- 3 Mention the two drawbacks of KL transform. 2
- 4 Construct Haddmard matrix of order  $N = 4$ . 2
- 5 Two images have same histogram. Which of the following properties must they have in common? 2
  - a) Same total power
  - b) Same entropy
  - c) Same inter pixel covariance function
- 6 What is the value of the marked pixel after a  $5 \times 5$  median filter. 2
 

2	1	3	4	5
1	1	0	2	3
2	0	0	1	2
5	1	2	3	1
4	3	1	2	0
- 7 List the three main properties of a median filter. 3
- 8 Explain fidelity criteria. 3
- 9 Explain the need for image compression and list few image compression techniques. 3
- 10 What is image segmentation? 3

**PART – B (50 Marks)**

- 11 a) Define digital image. Discuss various steps in image processing system. 8
  - b) An image is 2400 pixels wide and 2400 pixels high. The image was scanned at 300 dpi. What is the physical size of image? 2
- 12 a) Generate Haar basis for  $N = 4$ . 5
  - b) Explain Hadamard transform. 5
- 13 a) Discuss about image negative and compression of dynamic range. 5
  - b) Explain in detail about histogram equalization method of image enhancement. 5
- 14 a) Explain image restoration of degraded images by Wiener filtering. 5
  - b) What do you mean by speckle noise? Explain its removal techniques. 5
- 15 a) With the help of block diagram explain DPCM without quantizer. 4
  - b) A source emits four symbols {a, b, c, d} with probabilities 0.4, 0.2, 0.1 and 0.3 respectively. Construct arithmetic coding to oncode and decode the word 'dad'. 6
- 16 Write short notes on : 10
  - a) Image zooming techniques
  - b) Transform coding techniques
- 17 a) Explain low pass high pass and homomorphic filtering. 5
  - b) Explain lossless and lossy predictive coding. 5

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I - Semester (Main) Examination, December 2015****Subject : Embedded 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 Mention two important points when selecting a CPU for designing an embedded system product. 2
- 2 What are the three classifications of embedded systems write one example under each classification. 3
- 3 Mention any two differences between ARM7 Vs ARM9. 2
- 4 Differentiate RISC Vs CISC in the context of embedded system. 3
- 5 Mention the two important issues of porting TCP/IP stack into a microcontroller for designing a networked embedded system. 2
- 6 What is the importance of I<sup>2</sup>C protocol compared with the other serial protocols? 3
- 7 What is the method being opted for testing an interrupt service routing written in either in assembly or in embedded C using a cross compiler IDE? 2
- 8 Differentiate traditional compiler Vs cross compiler. Give two examples. 3
- 9 Define In Circuit Emulator (Embedded ICE). 2
- 10 Mention the techniques available to port or burn an embedded application into actual target Microcontroller Unit (MCU). 3

**PART – B (50 Marks)**

- 11 With the help of a neat process flowchart, explain the embedded system product Development life cycle with an example. 10
- 12 a) Mention the register organization of ARM, what are the various modes of ARM core? With the help of registers block diagram, explain the concept of mode specific banked registers. 8  
b) What is the need of Link Register and SPSR in ARM? 2
- 13 Explain in detail about the Control Area Network (CAN) protocol working principle; versions, features and data frame formats of CAN with an example. What are the advantages and disadvantages compared with other serial standards. 10
- 14 a) Define host and target. With the help of a block diagram mention the tools required in host for communicating with the target. 5  
b) What are the different techniques and tools used to test the embedded hardware and embedded software? 5
- 15 Mention the importance of hardware software partitioning. With a reference case study and flowchart, explain how the hardware software co design approach is validated for embedded system. 10
- 16 a) What is the importance of AMBA bus? With the architecture of AMBA bus, explain this protocol use in ARM based MCUs. 5  
b) What is JTAG? Why is JTAG used for ARM based targets? 5
- 17 Write a short note on any two : 2 x 5
  - a) Write a short note on thumb mode support of ARM
  - b) What are the important characteristics of PCI and PCI-X protocols?
  - c) Write a short note on Keil uVision4 IDE features for C51 and ARM targets.

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I – Semester (Main) Examination, December 2015****Subject: System Automation and Control (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  | Define the terms 'sensors' and 'transducers'.                                      | 2 |
| 2  | What are the factors to be considered during the selection of a sensor?            | 3 |
| 3  | Define the term 'Data acquisition'.  | 2 |
| 4  | Explain the term 'sampling'.   | 2 |
| 5  | Write a short note on electrical system building blocks.                           | 3 |
| 6  | List out the differences between rotational and translational engineering systems. | 3 |
| 7  | What are the main features of closed loop controllers?                             | 2 |
| 8  | Write a short note on the architecture of microcontroller.                         | 3 |
| 9  | What are the real world applications of motion control system?                     | 2 |
| 10 | Write a short note on feedback devices used for motion control and robotics.       | 3 |

**PART – B (50 Marks)**

- |    |  |    |
|----|--|----|
| 11 | Describe the following sensors briefly with examples.                                  | 10 |
|    | i) Proximity                      ii) Temperature                      iii) Light      |    |
|    | iv) Velocity                      v) Liquid level                                      |    |
| 12 | a) Explain dual slope integration A/D converter with the help of neat block diagram.   | 6  |
|    | b) What are the criteria to choose a suitable data acquisition equipment?              | 4  |
| 13 | Explain the fluid system and thermal system building blocks in detail.                 | 10 |
| 14 | Explain the basic structure, input/output processing and programming of PLC in detail. | 10 |
| 15 | a) Describe the general characteristics of a stepper motor.                            | 5  |
|    | b) What are the components of a motion control system? Explain them briefly.           | 5  |
| 16 | a) Explain the importance of system transfer function and frequency response.          | 6  |
|    | b) Describe the electro mechanical engineering system.                                 | 4  |
| 17 | Write short notes on:  |    |
|    | a) Various signal conditioning modules   | 6  |
|    | b) Fluid pressure sensor   | 4  |

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**FACULTY OF ENGINEERING****B.E. 4/4 (M / P /AE) I – Semester (Main) Examination, December 2015****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 What is “chassis”? List out its components.
- 2 What are the functions of inlet and exhaust manifolds?
- 3 What do you mean by overcooling and under cooling?
- 4 What are the purposes of lubricating system?
- 5 Explain the specifications of a tyre.
- 6 What are the functions of steering system?
- 7 What do you mean by four-wheel drive system?
- 8 Explain about a shock absorber.
- 9 What are the pollution control technologies used for diesel engines.
- 10 What do you mean by engine tune up?

**PART – B (50 Marks)**

- |   |   |
|---|---|
| 11 a) Explain the constructional features of a piston with a neat sketch.                             | 5 |
| b) Explain a wet liner with a neat sketch.  | 5 |
| 12 a) Explain about long reach and short reach spark plugs with a diagram.                            | 5 |
| b) Explain splash lubrication system with a neat diagram.   | 5 |
| 13 a) Explain the working principles of a pump circulation system used for cooling of an I.C. Engine. | 5 |
| b) Explain the major components of a lead-acid battery.   | 5 |
| 14 a) Sketch and explain the rack and pinion type of steering gear box.                               | 5 |
| b) Sketch and explain independent suspension system.  | 5 |
| 15 a) Compare tubed and tubeless tyres.   | 4 |
| b) Explain about universal joint and propeller shaft with sketches.                                   | 6 |
| 16 a) Explain the working principle of hydraulic braking system with a neat sketch.                   | 6 |
| b) Explain hand brake linkage with a sketch.  | 4 |
| 17 a) Explain Bharat stage norms of pollution.  | 5 |
| b) Explain different testing equipment used for automobiles.  | 5 |

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**FACULTY OF ENGINEERING****B.E. 4/4 (Mech.) I – Semester (Main) Examination, December 2015****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 Define azimuthal angle and declination
- 2 What are the merits of non-conventional energy sources?
- 3 Name different types of concentrating collectors.
- 4 Classify energy sources.
- 5 What is Magnus effect?
- 6 Mention salient advantages of “Windmill rotors”.
- 7 Write different layers of internal structure of the earth.
- 8 Explain the merits and demerits of biomass fuels.
- 9 What is pyrolysis?
- 10 Differentiate tidal and wave power.

**PART – B (5x10 = 50 Marks)**

- 11 a) What is global warming? Role of renewable energy in global warming reduction.  
b) Compare renewable and non-renewable energy sources.
- 12 a) Explain working of flat plate collector with line diagram and brief about types in that.  
b) Briefly explain solar water heating and cooling with sketch.
- 13 a) Write solar satellite working principle using sketch and explain its applications.  
b) Explain solar engines: Stirling, Brayton cycles.
- 14 a) Write short note on Savonius and Darrius rotor windmill.  
b) Explain characteristic curves of velocity and power in windmill.
- 15 a) Classify geothermal energy sources and explain them in brief.  
b) Explain constructional details of gasifier with neat sketch.
- 16 a) What is working of fixed drum and moving drum digester with sketch?  
b) Explain single basin double basin tidal plants.
- 17 a) Write working principle of Cluad and Anderson OTEC systems.  
b) What are the advantages and disadvantages of tidal and wave energy.

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**FACULTY OF ENGINEERING****B.E. 4/4 (M/P) I – Semester (Main) Examination, December 2015****Subject: Computational Fluid Flows (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  | State and explain the momentum equation for steady inviscid one-dimensional flow.           | 3 |
| 2  | What is thermal diffusivity? State and explain the terms of 1-D thermal diffusion equation. | 2 |
| 3  | What do you mean mixing length model? Explain briefly.                                      | 3 |
| 4  | Explain the significance of initial and boundary value problems.                            | 2 |
| 5  | Define the terms: Consistency, stability and analysis.                                      | 3 |
| 6  | What do you understand by “Convergence criteria”? Explain briefly.                          | 2 |
| 7  | Explain the mapping layout of C-type grid.  | 3 |
| 8  | Differentiate between structured and unstructured grids.                                    | 2 |
| 9  | Explain the terms involved in convection diffusion equation.                                | 2 |
| 10 | Compare and contrast Finite Difference Method with Finite Volume Method.                    | 3 |

**PART – B (5x10 = 50 Marks)**

- 11 Derive the continuity equation for inviscid flow in partial differential non-conservation form.
- 12 Describe the K-ε model as applicable to turbulence.
- 13 Write algebraic equations for 4x4 grid for the equation  $\frac{\partial T}{\partial t} = \frac{\partial^2 T}{\partial x^2}$  by using explicit scheme. Point out your comments.
- 14 Discuss the stability behaviour of second order wave equation by Von-Neumann method.
- 15 Illustrate the ‘solution algorithm’ for pressure-velocity coupling in steady flows.
- 16 Explain the step by step procedure for SIMPLE algorithm with the help of a flow chart.
- 17 Write short notes on the following:
- Gauss-Seidel and ADI methods
  - Discretization and round off error.

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**FACULTY OF ENGINEERING**

B.E. 4/4 (AE) I – Semester (Main) Examination, December 2015

**Subject: Metal Cutting and Machine Tool 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 What are the desirable properties of cutting tool materials?
- 2 Distinguish between continuous and discontinues chips.
- 3 State the principle of AJM.
- 4 Distinguish between orthogonal and oblique cutting ?
- 5 What are the applications of cutting fluid ?
- 6 What is the principle of USM ?
- 7 What is the difference between 3-jaw chuck and 4-jaw chuck? Explain
- 8 Define Drilling and milling.
- 9 Classify Jigs and fixtures.
- 10 Distinguish between lapping and honing process.

**PART- B (50 Marks)**

- 11 a) Define cutting, shear angle, chip velocities.  
b) During machining of C-25 steel the following observations are made:  
Feed = 0.2 mm/rev, speed = 200m/min, cutting force = 1600N, feed force = 850N,  
chip thickness = 0.39mm, rake angle =  $10^{\circ}$  calculate shear force, frictional force,  
work done.
- 12 Describe
  - a) 3-2-1 principle of location.
  - b) USM process
- 13 a) Discuss types of chip breakers and their role in metal cutting  
b) Distinguish between jig and fixture.
- 14 Describe
  - (a) Design principles for location and clamping.
  - (b) Metal removal rate
- 15 (a) Describe the geometry of single point cutting tool by ASA system.  
(b) Explain Thread milling and Thread grinding.
- 16 (a) Differences between shaper, planer and slotter.  
(b) Explain Quick return mechanism.
- 17 Describe the methods of taper turning on laathe.

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**FACULTY OF ENGINEERING**

B.E. 4/4 (AE) I – Semester (Main) Examination, December 2015

Subject: Vehicle Dynamics (Elective - I)

Time: 3 Hours

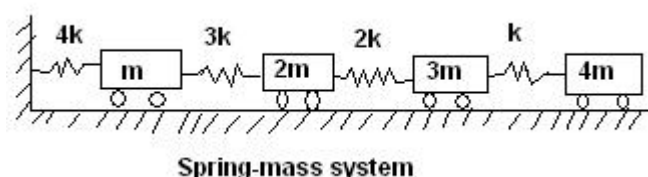
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**Note: Answer all questions from Part A. Answer any five questions from Part B.****Part A (25 Marks)**

- 1 Explain the causes of vibrations in machines, their harmful effects and their remedies.
- 2 Define the following terms with suitable examples:  
(a) Free vibrations, (b) Forced vibrations, (c) Damped vibrations
- 3 What do you mean by degrees of freedom? Give example for zero, single, two and multi-degrees of freedom systems.
- 4 Explain Holzer's method of analyzing multi-degree freedom systems.
- 5 Explain the effects of various factors on the performance of a tyre. In this respect justify the importance of tyre rotation
- 6 Write notes on (i) Aspect ratio of a tyre, (ii) Low profile tyre (iii) Ply rating and load index of a tyre (iv) Under – inflated tyre.
- 7 What are the principle of the vibrometer and accelerometer? What is the difference between these two?
- 8 Write an engineering brief on the whirling of rotating shafts, describing the phenomenon and indicating its importance in the design of machinery.
- 9 Differentiate between the following with the help of suitable sketches.  
(a) Bias-ply tyre, and a radial tyre (b) Belted-bias ply tyre, and a steel radial
- 10 What is meant by damping? Discuss briefly the various types of dampings used.

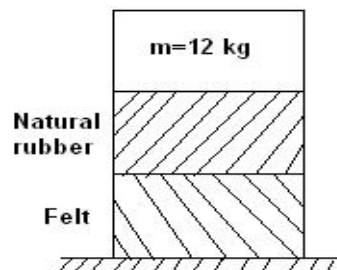
**Part B (50 Marks)**

- 11 Calculate the whirling speed of a shaft of 20mm diameter and 0.7m long carrying a mass of 1 kg at its mid-point. The density of the shaft material is  $40\text{mg/m}^3$  and young's modulus is  $200\text{ GN/m}^2$ . Assume the shaft to be freely supported.
- 12 Using Stodola method, determine the lowest natural frequency of the four-degree-of-freedom spring-mass system as shown in Fig below.

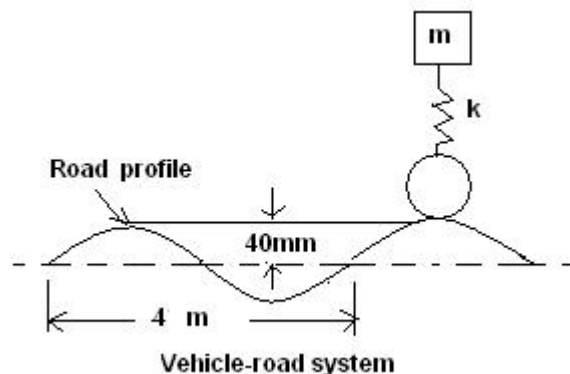


..2..

- 13 An instrument vibrates with a frequency of 1.24 Hz when there is no damping. When the damping is provided, the frequency of damped vibrations was observed to be 1.03 Hz. Find: (a) the damping factor, (b) the logarithmic decrement.
- 14 A mass of 12 kg is kept on two slabs of isolators placed one over the other, as shown in Figure. One of the isolators is a rubber having a stiffness of 2.5 KN/m and damping coefficient of 95 N-sec/m while the other isolator is of felt with stiffness of 10 KN/m and damping coefficient of 280 N-sec/m. If the system is set in motion in vertical direction, determine the damped and undamped natural frequencies of the system.



- 15 A refrigerator unit weighing 30 kgf is to be supported by three springs of stiffness 'k' each. If the unit operates at 580 rev/min, what should be the value of spring constant 'k' if only 10% of the shaking force of the unit is to be transmitted to the supporting structure?
- 16 A vehicle has a mass of 490 kg and the total spring constant of its suspension system is 58800 N/m. The profile of the road may be approximately to a sine wave of 40 mm amplitude and wavelength 4 m. Determine (i) critical speed of the vehicle, (ii) the amplitude of the steady state motion of the mass when the vehicle is driven at critical speed and  $\zeta = 0.5$ , and (iii) the amplitude of steady state motion of mass when the vehicle is driven at 57 km/h and damping factor = 0.5.



- 17 Write a short notes on following
- Causes of vibration and Effects of vibration
  - Static and dynamic coupling
  - Torsional vibration of circular shaft

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) I - Semester (Main) Examination, December 2015****Subject : Image Processing (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 Define spatial and Intensity resolution. 3
- 2 Calculate the size of the image formed in eye if person looks at object of 15m at a distance of 100m and focal length of the eye lens is 17mm. 2
- 3 Calculate the Fourier transform of the unit impulse located at origin. 2
- 4 What is relationship between sampling and frequency intervals? 2
- 5 What is a Histogram? 3
- 6 What are the fundamental properties of segmentation of an image? 3
- 7 List the different types of data redundancies that can be identified in an uncompressed image. 2
- 8 Explain the Fidelity criteria used in image processing while compressing an image. 3
- 9 How can an inverse filter reduce image blurs? 3
- 10 List the valid values of each RGB component in a safe color. 2

**PART – B (50 Marks)**

- 11 a) Discuss the fundamental steps in digital image processing with a neat diagram. 6
- b) What do you understand by image acquisition using single sensor using sensor strips and using sensor arrays? Explain in detail. 4
- 12 a) Show that Fourier transform of convolution of two functions in the spatial domain is equal to the product of the Fourier transform of the two functions in the frequency domain. 5+5
- b) Explain the image sharpening using frequency domain filters.
- 13 a) Explain the Canny edge detector algorithm. 5+5
- b) Formulate equation to find the equalized image of the image having PDF  

$$\Pr(r) = \begin{cases} 2r/(L-1)^2 & \text{for } 0 \leq r \leq L-1 \\ 0 & \text{otherwise} \end{cases}$$
- 14 Calculate the Huffman code for the symbols with probability as given below. 10

Symbol	A1	A2	A3	A4	A5	A6
Probability	.3	.2	.1	.2	.15	.05
- 15 Explain the different models of noises arises during the image acquisition and transmission. 10
- 16 Explain the different linear and nonlinear smoothing spatial filters. 10
- 17 Discuss the pseudo color image processing. 10

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) I - Semester (Main) Examination, December 2015****Subject : Software Project 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 (25 Marks)**

- |   |   |
|---|---|
| 1 Draw a neat diagram of risk profile of a conventional software project across its life cycle. | 3 |
| 2 Mention the three dimensions of schedule improvement.   | 2 |
| 3 Mention the results of conventional software project design reviews.                          | 3 |
| 4 Explain MTBF and maturity.  | 2 |
| 5 Discuss cost variance versus schedule variance.   | 2 |
| 6 Define workflow.  | 2 |
| 7 How do we calculate risk exposure value and risk reduction leverage?                          | 3 |
| 8 How do we calculate ROI (Return on Investment)?   | 2 |
| 9 Are peer reviews secondary or primary? Justify.   | 3 |
| 10 Define stakeholder. Who are stake holders?   | 3 |

**PART – B (50 Marks)**

- |  |   |
|--|---|
| 11 a) Write short notes on pragmatic software cost estimation.   | 5 |
| b) How do we improve team effectiveness?   | 5 |
| 12 a) Explain conventional process versus modern iterative process interms of general quality improvements.  | 5 |
| b) What are default agendas for the life cycle architecture milestone? Explain.                              | 5 |
| 13 Write short notes on the following :  |   |
| a) Define round trips engineering. What is the primary reason for round-trip engineering? Explain.           | 5 |
| b) What are the stakeholder environment?   | 5 |
| 14 a) Write the basic parameters of an earned value system.  | 5 |
| b) How the assessment in performance is done and what are the influencing factors?                           | 5 |
| 15 Write short notes on the following :  |   |
| a) Software management best practices  | 5 |
| b) Next generation cost models   | 5 |
| 16 a) Write an overview on ISO 12207.  |   |
| b) Process improvement and mapping to CMM.   |   |
| 17 CMM classifies software development organization into five maturity levels. Explain each level in detail. |   |

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) I - Semester (Main) Examination, December 2015****Subject : Mobile Computing (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 Explain MSK.  | 2 |
| 2 What is Signal propagation?   | 3 |
| 3 Draw the MOT object structure and explain.                                  | 3 |
| 4 What are the function of GGSN and SGSN in GPRS?                             | 2 |
| 5 List some of the advantages of Wireless LAN.                                | 3 |
| 6 What do you understand by piconet and scatternet in Bluetooth?              | 2 |
| 7 What are performance enhancing proxies?                                     | 3 |
| 8 What is COA? Write difference between foreign agent COA and Co-located COA. | 2 |
| 9 Write about WML script.   | 3 |
| 10 What is the goals of WLS layer?  | 2 |

**PART – B (50 Marks)**

- 11 a) What is multiplexing? Compare time division multiplexing and code division multiplexing.  
b) Explain the term hidden and exposed terminals, near and far terminals in medium access control.
- 12 a) Sketch GSM architecture and explain briefly.  
b) What do you mean by digital video broadcasting? Explain
- 13 What is Hiper LAN? Explain architecture of infrastructure based Hiper LAN2. Also explain its protocol stacks.
- 14 a) What is Mobile Adhoc Network? Explain the difference between wired network and Adhoc wireless network.  
b) Write the advantages and disadvantages of Mobile TCP.
- 15 a) What is WAP? Briefly explain its architecture.  
b) List out the features of Symbian OS.
- 16 a) Write down the advantages of Cellular systems.  
b) Explain about GEO, LEO and MEO in satellite system.
- 17 Write short notes on the following :
- Infrared transmission
  - DHCP
  - Java Card support for mobility

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I – Semester (Main) Examination, December 2015****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  | Define object oriented software engineering.                         | 2 |
| 2  | What are the basic principles of software re-use.                    | 3 |
| 3  | What is a creational pattern? What is the intent of factory pattern? | 3 |
| 4  | What are the advantages of chain of responsibility pattern?          | 2 |
| 5  | What is the intent of pipes and filters architectural pattern?       | 2 |
| 6  | What are the models developed during software engineering process?   | 2 |
| 7  | What is the intent of broker architectural pattern?                  | 2 |
| 8  | What is the purpose of template and strategy patterns?               | 3 |
| 9  | What are the guidelines for selecting a particular design pattern?   | 3 |
| 10 | Mention the advantages of software reuse.                            | 3 |

**PART – B (50 Marks)**

- |    |  |    |
|----|--|----|
| 11 | a) Explain how analysis model shapes system architecture.  | 5  |
|    | b) Explain how software re-use can be adapted systematically and incrementally.                  | 5  |
| 12 | Explain the intent, motivation, applicability structure and implementation of decorator pattern. | 10 |
| 13 | a) Explain how whole part hierarchies are represented with underlying structure.                 | 5  |
|    | b) Explain about presentation – abstraction – control pattern.                                   | 5  |
| 14 | Explain in detail about observer pattern.  | 10 |
| 15 | Explain in detail about the blackboard architecture for repository systems.                      | 10 |
| 16 | a) Explain briefly about broker architecture.  | 5  |
|    | b) Explain the publisher-subscriber design pattern.  | 5  |
| 17 | Write short notes on:  |    |
|    | a) Use case components   | 5  |
|    | b) Micro Kernel architecture.  | 5  |

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I - Semester (Main) Examination, December 2015****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  | Define the terms Grid Computing, cluster computing and cloud computing. | 3 |
| 2  | What is meant by staging data?  | 2 |
| 3  | Explain the concept of co-scheduling.                                   | 3 |
| 4  | What is meant by cross certification?                                   | 2 |
| 5  | “Web services are usually stateless” – Justify.                         | 3 |
| 6  | Give any four WSRF specifications.                                      | 2 |
| 7  | What are legacy programs?   | 2 |
| 8  | Write about web service wrapper approach.                               | 3 |
| 9  | What is MPI_gather () ?   | 2 |
| 10 | Differentiate between condor and condor-g.                              | 3 |

**PART – B (50 Marks)**

- |    |   |     |
|----|---|-----|
| 11 | Explain the process of Globus job submission.   | 10  |
| 12 | Differentiate between mutual authentication and single sided authentication.  | 10  |
| 13 | a) Discuss about Web service container.<br>b) Write briefly about WS notification.  | 5+5 |
| 14 | Write about MPI point-to-point communication.   | 10  |
| 15 | How resource management is achieved using Gridbus?  | 10  |
| 16 | a) Write briefly about Sun Grid Engine.<br>b) Explain about QoS in Grid scheduling.   | 5+5 |
| 17 | Write short notes on any <b>Two</b> :<br>a) Service oriented Architecture<br>b) GSI authentication<br>c) Transient Services | 5+5 |

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I - Semester (Main) Examination, December 2015****Subject : Semantic Web (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  | What are the themes related to Semantic Web?                         | 3 |
| 2  | Mention McGuinness Ontology Spectrum classification.                 | 2 |
| 3  | Give examples of atomic concepts and atomic roles.                   | 2 |
| 4  | Draw an RDF graph.   | 2 |
| 5  | How are property restrictions ensured in OWL lite?                   | 3 |
| 6  | Define Datalog alphabet.   | 2 |
| 7  | State the purpose of Web services description language.              | 3 |
| 8  | List the major stages of KACTUS project ontology development method. | 3 |
| 9  | Exemplify preservation metadata and descriptive metadata.            | 2 |
| 10 | What is Word Net?  | 3 |

**PART – B (50 Marks)**

- |    |   |    |
|----|---|----|
| 11 | a) Differentiate between Taxonomies, Thesauri and Ontologies.                               | 5  |
|    | b) Explain the architecture of Semantic Web.  | 5  |
| 12 | How is knowledge represented using description logic?                                       | 10 |
| 13 | Give a brief summary of OWL vocabulary.   | 10 |
| 14 | Write about Web services security standards.  | 10 |
| 15 | a) Justify “Semantic Web is neither Artificial Intelligence nor a separate web”.            | 5  |
|    | b) Write about RDF properties and individuals.  | 5  |
| 16 | a) Discuss semantic Web Rule Language.  | 5  |
|    | b) List the pros and cons of different techniques used in software requirement elicitation. | 5  |
| 17 | Explain different agent forms   | 10 |

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