

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

- 1 State any three principles of planning of residential buildings.
- 2 To get good ventilation in a room, how many windows are required and why?
- 3 Discuss the importance of Acoustics in buildings.
- 4 List out any three sound absorbent materials.
- 5 List out safety precautions for lifts.
- 6 Briefly discuss about electrical supply installations in houses.
- 7 Discuss the concept of green buildings.
- 8 List out different low energy materials used in green buildings.
- 9 Differentiate between 'UNION' and 'SUBTRACT' commands.
- 10 What are Boolean commands?

**PART – B (5x10 = 50 Marks)**

- 11 a) What is planning with respect to buildings? Mention the factors to be considered for selecting the site for a residential building. 5
  - b) As per building bye-laws, state different provisions for lighting and ventilation in buildings. 5
- 12 a) What is meant by frequency of sound? Discuss in detail the process of measurement of sound. 5
  - b) Explain the process of distribution of sound in an auditorium. Discuss different measures to make the auditorium acoustically good. 5
- 13 Draw a typical water supply arrangement inside the house. Indicate all features in the diagram. 10
- 14 a) Explain the meaning of green building. State the different ratings of green buildings under LEED. 5
  - b) Write a short note on energy consumption in buildings. 5

- 15 Plan a residential building, given the sizes of different rooms. Building faces North. 10
- |  |   |
|--|---|
| i) Master bed room = 14 m <sup>2</sup> | ii) Living room = 20 m <sup>2</sup>       |
| iii) Dining area = 8 m <sup>2</sup>    | iv) Kitchen = 8 m <sup>2</sup>            |
| v) Verandah = 6 m <sup>2</sup>         | vi) Children bed room = 14 m <sup>2</sup> |
- Provide doors and windows wherever necessary with suitable dimensions.
- 16 a) Sketch the circulation diagram for a residential building and explain the importance of circulation in buildings. 5
- b) What is the need of ventilation in buildings? Describe briefly the functional requirements of a good ventilation system. 5
- 17 Write short notes on the following:
- |  |   |
|--|---|
| i) Different commands in Auto CAD 3D               | 5 |
| ii) Fire safety measures in residential buildings. | 5 |

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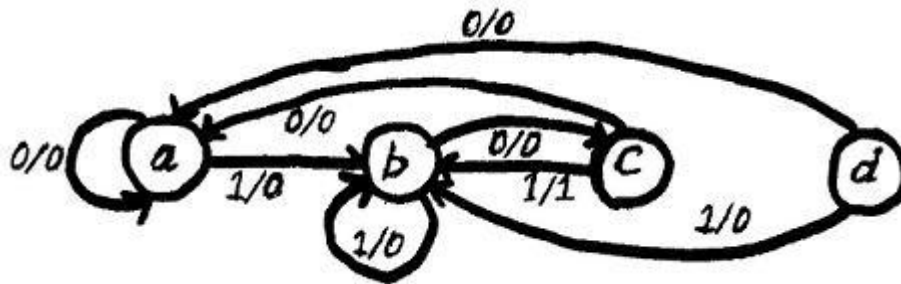
**FACULTY OF ENGINEERING****B.E. 3/4 (EEE / INST.) I-Semester (Main & Backlog) Examination, December 2017****Subject: Digital Electronics And Logical Design****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from part – A & Any five questions from part - B****Part – A**

1. How Pair in K-Map Eliminates One Variable and Its Compliment? Explain it with suitable example. [2M]
2. Make a 4 input NAND gate using 2 input NAND gates. [3M]
3. Use 2's compliment and subtract  $1101 - 11101$ . [3M]
4. What are the differences between the parallel and serial adders? [2M]
5. How schottky transistors are formed? And state its uses. [2M]
6. Define the following: wired logic, power dissipation, propagation delay and nose margin. [3M]
7. Compare synchronous and asynchronous counters. [3M]
8. Why a gated D latch called a transparent latch? [2M]
9. Why was PAL developed? Why the input variables to a PAL are buffered? [3M]
10. Define state diagram. [2M]

**PART-B**

11. Minimize the following function containing don't cares using K-Map. [10M]  
 $f(A,B,C,D) = \sum m(3,10,12,19,23,29) + d(5,7,13,26,28)$  realize the SOP using only NAND gates and POS using only NOR gates. [10M]
12. a) Design a logic circuit to convert the excess – 3 code to BCD code. [6M]  
 b) Add – 125 to + 56 using the 8 bit 2's compliment arithmetic. [4M]
13. a) With the help of a relevant circuit schematic, briefly describe the operation of ECL OR/NOR logic. [4M]  
 b) Explain in detail about BCD to Seven segment decoder. [6M]
14. a) Explain the working of serial in serial out shift register with logic diagram and waveforms. [6M]  
 b) Show that the JK flip flop can be operated as a toggle flip flop [4M]

15. Distinguish between a Programmable Logic Array (PLA) device and a Programmable Array Logic (PAL) device in terms of architecture and capability to implement Boolean functions. [10M]
16. Design a clocked sequential machine using D flip flops for the state diagram shown in figure. Use state reduction if possible and make proper state assignment. [10M]



17. a) With the help of neat diagram explain the working of a two – input TTL NAND gate. [5M]  
 b) Compare Mealy and Moore models. [5M]

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## FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I – Semester (Main & BL) Examination, December 2017

Subject: Analogy Communication

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. Calculate the net modulation index and power associated with AM signal  
 $S(t) = 8 \cos 2\pi 10^6 t + 4 \cos 2\pi 10^6 t \cos 2\pi 10^4 t + 2\pi \cos 2\pi 10^6 t \cos 2\pi 10^3 t$  (3)
2. What are the properties of Hilbert transform. Find the Hilbert transform of a signal  
 $m(t) = 2 \sin 2\pi f_m t$  (3)
3. Discuss the coherent detection of DSB-SC signals. What is Quadrature null effect? (3)
4. Compare AM and FM. (3)
5. Determine the modulation index, peak frequency deviation, power and bandwidth of a single tone FM signal represented by  $S(t) = 12 \cos (2\pi 10^8 t + 6 \sin 4\pi 10^3 t)$  (3)
6. When a super heterodyne receiver is tuned to 555 KHz. What is the image frequency? The antenna of this receiver is connected to the mixer via a tuned circuit whose loaded Q is 40. Find Image Frequency Rejection Ratio (IFRR). (2)
7. Define Selectivity and Sensitivity (2)
8. Where do we employ Pre-emphasis and De-emphasis circuits and Why? (2)
9. Give the classification of transmitters (2)
10. Determine the Nyquist rate of sampling for the signal  $V(t) = \cos^2 6000\pi t$ . What is aliasing? (2)

### PART-B (10 x 5 = 50MARKS)

- 11 a) Suggest a method to produce AM signal using a device having the transfer characteristic  $V_o = (V_i + 2)^2$ . Give the block diagram and find the amplitude sensitivity of the modulator. Draw the spectrum. (5)
- b) Draw the block diagram of phase discrimination method to generate SSB-SC signal. What are the advantages of SSB-SC over other linear modulation techniques? (5)
- 12 a) Discuss generation of NBFM signal. Bring out the similarities and differences between NBFM and AM (5)
- b) Explain the working of Foster-Seeley Discriminator for FM demodulation (5)
- 13 a) With a neat sketch explain the operation of Armstrong Indirect FM transmitter (6)
- b) Find the equivalent Noise Bandwidth of an RC low pass filter. If the Power Spectral Density of thermal noise power at the input of this filter is  $2KT$ , find the output noise power (4)

- 14 a) Derive the expression for Figure of merit (FOM) of DSB-SC system. (6)
- b) Find the equivalent Noise Bandwidth of an RC low pass filter. If the Power Spectral Density of thermal noise power at the input of the filter is  $2KT R$ , find the output noise power. (4)
- 15 a) Explain the generation and detection of Pulse Position Modulated (PPM) signal with neat diagrams and waveforms (7)
- b) The front end of a television receiver having a BW of 7MHz and operating at a temperature of  $27^{\circ}\text{C}$ , consists of an amplifier having a gain of 15 followed by a mixer whose gain is 20. The amplifier has a  $300\Omega$  input resistor and a shot noise equivalent resistance of  $500\Omega$ . For the converter these values are  $2.2\text{K}\Omega$  and  $13.5\Omega$  respectively and the mixer load resistance is  $470\text{k}\Omega$ . Calculate  $R_{\text{eq}}$  and RMS noise voltage for this television receiver (3)
- 16 a) With necessary mathematical analysis explain Natural sampling and Flat – top sampling. (5)
- b) Compare PAM, PWM and PPM (5)
- 17 Write short notes on the following:
- a) Choice of Intermediate Frequency (5)
- b) Vestigial Side Band Modulation (5)

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**FACULTY OF ENGINEERING****B.E. 3/4 (Mech.) I Semester(Main &Backlog) Examination, Dec, 2017****Subject : Hydraulic Machinery and Systems****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. A jet of water of 100 mm diameter impinges normally on a fixed plate with a velocity of 30 m/s. The force exerted on the plate is ,  
 a) 7.07 K                      b) 7.70 KN                      c)7.71 KN                      d) 7.17 KN                      [3]
2. The amount of work saved by fitting an air vessel to a double acting reciprocating pump is,  
 a) 39.20%                      b) 48.8                      c) 84.8%                      d) 88.4%                      [2]
3. The Cavitation in turbine is caused by  
 a) High velocity                      b) Low Pressure  
 c) High Pressure                      d) Low barometric Pressure                      [2]
4. The type of turbine used is \_\_\_\_ If the head is 150 m to develop 1500kw while running at 300 r.p.m  
 a) Pelton Wheel                      b) Francis turbine  
 c) Kaplan turbine                      d) None of the above                      [3]
5. A single acting Reciprocating Pump is running at 100 r.p.m delivers 12 lit/sec The diameter and stroke of the cylinder are 20cm and 30 cm respectively. The discharge of the pump is given by  
 a) 0.674                      b) 0.764                      c) 0.476                      d) 0.647                      [3]
6. Maximum efficiency of a series of vertical plates is,  
 a) 66.67%                      b) 33.33%                      c) 50%                      d) 80%                      [3]
7. The overall efficiency of a Pelton Wheel is 70%. If the mechanical efficiency is 85%. The hydraulic efficiency will be,  
 a) 62.5%                      b) 72.3%                      c) 82.4%                      d) 87.4%                      [3]
8. The function of hydraulic accumulation is,  
 a) To store K.E of the fluid                      b) To store pressure energy of the fluid  
 c) To store K.E and Pressure energy of the fluid  
 d) All the above                      [2]
9. The Parameter that affect notes level of hydrostatic pump is  
 a) Size of the pump                      b) Speed of the pump  
 c) Entrained air bubbles                      d) All the above                      [2]

10. What will happen if requirements of NPSH for a given pump are not satisfied
- a) The pump will get Cavitated
  - b) The pump will consume more power
  - c) The pump will not develop head
  - d) The pump will have low efficiency.
- [2]

**PART – B (50 Marks)**

11. A 7.5 cm diameter jet having a velocity of 30m/s strikes a flat plate, the normal of which is inclined at  $45^\circ$  to the axis of the jet. Find the normal force on the plate
- (i) When the plate is stationary
  - ii) When the plate is moving with a velocity of 15 m/s and away from the jet. Also determine the power and efficiency of the jet when the plate is moving.
12. Explain the working principle and basic components of hydraulic circuit with neat sketch.
13. The internal and external diameter of the impeller of a centrifugal pump are 200mm and 400 mm respectively. The pump is running at 1200 r.p.m. The vane angles of the impeller at inlet and outlet are  $20^\circ$  and  $30^\circ$  respectively. The water enters the impeller radially and velocity of flow is constant. Determine the work done by the impeller per unit weight of water.
14. Design a Pelton Wheel for the following data;  
Head=72m , Speed of the wheel=240 r.p.m Shaft power of the wheel =115 Kw.  
Speed ratio=0.45 Coefficient of velocity =0.98 Overall efficiency=85%.
15. The length and diameter of a suction pipe of a single acting reciprocating pump are 5m and 10cm respectively. The pump has a plunger diameter 15cm and a stroke length of 35cm. The centre of the pump is 3m above the water surface in the sump. Determine,
- i) Pressure head due to acceleration at the beginning of the suction stroke.
  - ii) Maximum pressure head due to acceleration.
  - iii) Pressure head in the cylinder at the beginning and at the end of the stroke.(Take atmospheric pressure head =10.3 m of water).
16. a) What are the functions of air vessels in Reciprocating pump.  
b) What is meant by model testing of Centrifugal pump? What are the conditions? to be satisfied in model testing?
17. What are the different types of characteristic curves of turbines? Explain briefly.
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**FACULTY OF ENGINEERING**

**BE 3/4 (Prod.) I-Semester (Main & Backlog) Examination, Dec, 2017**

**Subject : Machine Tool Engineering**

**Time : 3 hours**

**Max. Marks : 75**

Note : Answer all questions from Part-A and Any Five Questions From Part-B.

**PART – A (25 Marks)**

- 1 What are the different types of cutting fluids used in machining? Mention their influence on environmental aspects.
- 2 What is the influence of rake angle on machining performance?
- 3 Indicate various sources of heat in turning process.
- 4 What do you understand by tool life? How do you measure it?
- 5 How the power required in machining is expressed?
- 6 How a grinding wheel is selected?
- 7 Sketch various operations that can be performed on drilling machine.
- 8 Differentiate between Up milling and Down milling.
- 9 Name at least 4 'G' codes and 4'M' codes in manual part programming.
- 10 Define the terms part families, part classification and coding system.

**PART – B (5X10 = 50 Marks)**

11. a) Define Rake angle. Discuss the effect of rake angle in chip formation. When negative rake angles are preferred.  
b) Explain the functions of chip breakers.
12. a) While machining mild steel work piece at a cutting speed of 40m/min the tool life of tool is observed to be 50min. What will be the tool life, if the same tool is used to cut at 20% reduced speed. The value of exponent in Taylors equation is 0.1.  
b) Explain the various design features for multi point cutting tools.
13. a) Sketch various operations on lathe with neat diagram.  
b) Differentiate and explain different thread cutting and thread forming operations.
- 14.a) With neat sketches, explain different types of indexing methods with milling machines.  
b) Explain gear hobbing with neat diagram.

15. a) Mention the different methods of classification of engineering components in group technology and discuss one of the methods in detail.
- b) Explain Adaptive control system.
16. In orthogonal turning operation following data are observed. Workpiece Diameter = 50mm, speed=100m/min, feed =0.2mm/rev, rake angle  $15^\circ$ , Chip Thickness = 0.25 mm, cutting force=200N, feed force=50N. Calculate shear plane angle, coefficient of friction, cutting power, chip flow velocity and shear force.
17. Write short notes on:
- Tool wear criteria
  - Taps and dies
  - Canned cycles.

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**FACULTY OF ENGINEERING****BE 3/4 (AE) I-Semester (Main & BL) Examination, Dec, 2017****Subject : Automotive Chassis Components****Time : 3 hours****Max. Marks : 75****Note : Answer all questions from Part-A and Any Five Questions From Part-B.****PART – A (10x2.5 = 25 Marks)**

- 1 What are the different types of automobile vehicles?
- 2 List out the various components of chassis.
- 3 Draw the front Axle of conventional chassis from and list out the parts.
- 4 Explain with a neat sketch of steering linkage of conventional chassis flame.
- 5 Explain non slip differential.
- 6 Explain twin speed final drive.
- 7 What are the requirements of suspension system?
- 8 What are the different types of rear end suspension?
- 9 Explain how the parking brakes works.
- 10 What are the advantages and disadvantages of Air brakes?

**PART – B**

11. Briefly explain the classification of chasis frame According to  
(a) Engine location (b) Wheels (c) Body (d) Drive (e) Frame. (10)
12. Explain  
(i) Caster  
(ii) Camber  
(iii) Toe-in Toe-out  
(iv) King pin inclination  
(v) Slip Angle
13. a) What is the function of slip joint ? and universal joint? (4)  
b) With the help of a neat diagram describe Torque tubedrive? (6)
14. (a) Why are hypoid gears used in final drive? (3)  
(b) Why is differential necessary in the transmission system of a car? Draw sketches of different types of differential housing. (7)
15. a) Draw and Explain the function of a torsion bar? (4)  
b) Describe the construction and working of a telescopic shock absorber. (6)
16. Explain with a neat sketch of Hydraulic brakes. (10)
17. Explain the following.  
a) Turning Radius (2)  
b) Independent suspension (3)  
c) Brake Bleeding (3)  
d) Wheel wobble (2)

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**FACULTY OF ENGINEERING****B.E. 3/4 (CSE) I – Semester (New) (Suppl.) Examination, December 2017****Subject: Software Engineering****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A and any five questions from Part B.****PART – A (25 Marks)**

- |    |   |   |
|----|---|---|
| 1  | Give a representation of process framework.                 | 2 |
| 2  | What are prescriptive process models?                       | 3 |
| 3  | Why do we use CPM (Critical Path Method)?                   | 3 |
| 4  | What is Earned Value Analysis?                              | 3 |
| 5  | What is data modeling? What is its importance?              | 2 |
| 6  | Differentiate analysis and design classes using an example. | 2 |
| 7  | What is an Architectural Style?                             | 2 |
| 8  | Differentiate between Cohesion and Coupling.                | 3 |
| 9  | What is Equivalence Partitioning?                           | 3 |
| 10 | What is Recovery Testing?                                   | 2 |

**PART – B (5x10 = 50 Marks)**

- |       |   |                            |
|-------|---|----------------------------|
| 11 a) | What do various levels of CMM represent? What are the key process areas associated with each level of CMM?            | 5                          |
| b)    | Discuss the traditional waterfall model in detail.  | 5                          |
| 12 a) | List various requirements engineering tasks. Explain about inception in detail.                                       | 5                          |
| b)    | What is Effort Estimation? Explain the various techniques of Effort Estimation?                                       | 5                          |
| 13 a) | What are Design Classes? What are the four characteristics of a well formed design class?                             | 5                          |
| b)    | Explain Scenario-Based modeling concepts with an example.   | 5                          |
| 14 a) | Distinguish between the following architectural styles with examples.   | 6                          |
| i)    | Data Centered Architecture  | ii) Data Flow Architecture |
| iii)  | Layered Architecture  |                            |
| b)    | Explain in detail the interface Analysis and Design Models. Also discuss the phases of User Interface Design process. |                            |
| 15 a) | Briefly explain the different kinds of metrics that are useful for testing.   | 4                          |
| b)    | What are testing patterns?  | 3                          |
| c)    | What is validation testing?   | 3                          |

- 16 a) Differentiate between the terms Architectural Style, Architectural Pattern and Framework. 4
- b) What is a Context Level DFD? Give an example. 3
- c) What is a use case? Give an example. 3
- 17 a) List any five Agile Principles and explain them in your own words. 4
- b) Discuss the concept of Extreme Programming (XP) model with the help of a diagram. List any three strengths and weaknesses of the model. 6

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**FACULTY OF INFORMATICS****B.E. 3/4 (IT) I-Semester (Main & Backlog) Examination, December 2017****Subject : Software Engineering****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 Software Engineering?                                     | 2 |
| 2  | Explain functional and non-functional requirements.               | 3 |
| 3  | List the tasks involved in Requirements Engineering.              | 2 |
| 4  | Define software quality.  | 2 |
| 5  | Define Unit Testing, Alpha Test and Beta Test.                    | 3 |
| 6  | What is testing and debugging?                                    | 2 |
| 7  | What are the elements of Software Configuration Management (SCM)? | 3 |
| 8  | Differentiate black and white box testing.                        | 3 |
| 9  | List few software risks.  | 2 |
| 10 | Differentiate between Verification and Validation.                | 3 |

**PART – B (50 Marks)**

- |    |  |   |
|----|--|---|
| 11 | a) What is process framework? Explain.   | 5 |
|    | b) Explain in detail the waterfall model.                                      | 5 |
| 12 | a) Explain coupling and cohesion. List various types of Coupling and Cohesion. | 5 |
|    | b) Explain various design concepts.  | 5 |
| 13 | a) Explain SQA plan.   | 5 |
|    | b) Explain about validation testing and system testing.                        | 5 |
| 14 | a) What is Risk? Explain how risk is managed in software development.          | 5 |
|    | b) Differentiate Proactive and Reactive risks.                                 | 5 |
| 15 | a) What is RMMM. Explain RMMM plan.  | 5 |
|    | b) Explain Software Project Estimation.  | 5 |
| 16 | a) Explain RAD model.  | 5 |
|    | b) What is Component level design?   | 5 |
| 17 | Short notes on the following :   |   |
|    | a) Incremental model   | 3 |
|    | b) SQA Tasks and Goals   | 4 |
|    | c) CMMI levels   | 3 |

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