Code No. D-2413/AICTE

FACULTY OF ENGINEERING

B.E. (ECE) VII - Semester (AICTE) (Main) Examination, March / April 2022

Subject: Road Safety Engineering
Open Elective – II

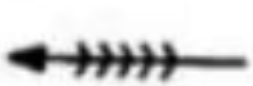
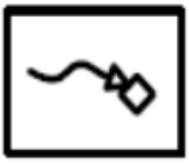
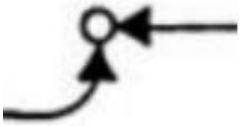
Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 List the 3 macroscopic traffic parameters and define any two with their units.
2 Define highway capacity.
3 Explain aisle width in design of 45° parking.
4 What is road crash collision diagram?
5 In collision diagram, what does following symbols represent?

a.  b.  c.  d. 

6 List the different methods to identify hazardous locations.
7 Enumerate the types of traffic signals.
8 List the different types of traffic signs.
9 List the different stages of Road Safety Audit.
10 Explain 3E's to enhance road safety.

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 Explain Regression technique statistical methods used in Traffic Safety Analysis.

12 List the different sources, advantages and disadvantages of accident data collection.

13 Explain different traffic management measure and their influence on Accident prevention.

14 Explain the effect of horizontal alignment design parameters that effect on road safety.

15 List the factors affecting traffic signal design, its advantages and disadvantages on urban roads with respect to traffic safety.

16 Briefly explain the safety provisions to be considered for pedestrians and cyclists on urban roads.

17 Explain with the flow chart and process of construction stage road safety audit.

****

Code No. D-2414/AICTE

FACULTY OF ENGINEERING

B.E. (ECE) VII - Semester (AICTE) (Main) Examination, March / April 2022

Subject: Fundamentals of AI and ML
Open Elective – III

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 How does AI work?
2 What are the problems solved by AI?
3 How do you evaluate a search technique?
4 What is ends means analysis why is it important?
5 What are the different types of learning in machine learning?
6 What is meant by hierarchical clustering?
7 Where are statistical models used?
8 What are the components of artificial neural network?
9 What are the benefits of machine learning?
10 What is ensemble classifier in machine learning?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 (a) What are the problems & disadvantages of artificial intelligence?
(b) What are applications of artificial intelligence?

12 (a) What is mean ends analysis & why it is important in AI?
(b) What are the various approaches and issues in knowledge representation?

13 (a) Discuss briefly about machine learning.
(b) What is K-means clustering and how it works?

14 (a) Explain the different types of classifiers.
(b) What are neural network and its types? What are the 3 components of the neural network?

15 (a) How does SVM work in machine learning?
(b) What are the properties of adaptive resonance theory?

16 (a) What are the generations of artificial intelligence?
(b) What is case based reasoning explain its steps?

17 Write short notes on:
(a) Ensemble Classifiers
(b) Fuzzy Clustering.

****

Code No. D-2415/AICTE

FACULTY OF ENGINEERING

B.E. (ECE) VII - Semester (AICTE) (Main) Examination, March / April 2022

Subject: Programmable Logic Controllers
Open Elective – III

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 Mention few device connected to the input of PLC.
2 Draw the block diagram of PLC and name the parts.
3 Write different PLC input instructions?
4 What Convert following word description in to PLC ladder diagram? Output 122 is to be on only when either inputs 7 and 8 are on or if inputs 17 or 18 are on. Output 122 can be on when all four inputs are on.
5 What is PLC counter?
6 What is meant by non-retentive timer?
7 Write the different log function.
8 Convert the hexa number ADE to octal.
9 Explain PLC SKIP function.
10 List few advantages of PLC.

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 (a) Discuss about on/off switching devices of PLC.
(b) Discuss the input and output devices which are connected to PLC.

12 Design a ladder diagram and flow chart for a fundamental industrial control problem: spray process system.

13 (a) What are PLC register? Explain them.
(b) Explain ON DELAY. Output B comes on at specific set time after output A is turned on. When A is turn off, B also goes off?

14 (a) Explain the addition function of PLC with an example.
(b) Explain about the comparison function in PLC.

15 (a) Discuss the need of PLC matrix function.
(b) List few PLC functions and explain them.

16 Write short notes on the following:
(a) PLC functions working with bits.
(b) CPU and programmer monitor of PLC.

17 (a) Explain about PLC timer function.
(b) Explain the concept of operational research in PLC programming.

****

Code No. D-2417/AICTE

FACULTY OF ENGINEERING

B.E. (ECE) VII - Semester (AICTE) (Main) Examination, March / April 2022

Subject: Software Engineering
Open Elective – III

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 What are the advantages of incremental process model?
2 What are the 3 types of Evolutionary models?
3 What are the main principles of software engineering?
4 What is validating requirements in software engineering?
5 What is design quality?
6 How do you create a behavioral model?
7 What is component?
8 Differentiate Coupling and Cohesion.
9 What are various levels of testing?
10 What is conventional testing?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 (a) Explain the Waterfall process model with a neat diagram.
(b) Discuss the aspect-oriented software development process models.

12 (a) Explain the principles of communication in software engineering.
(b) Discuss briefly the Business process engineering concept.

13 (a) Describe briefly the different steps in flow-oriented modeling.
(b) Discuss briefly the pattern-based design concept.

14 (a) Explain briefly the different styles and patterns for architectural design.
(b) Explain the Theo mandel rules for interface design.

15 (a) Discuss the testing strategies for object-oriented software.
(b) Explain briefly the elements software quality assurance.

16 (a) Explain briefly the incremental process models.
(b) Discuss briefly the Black-box testing.

17 Write short notes on:
(a) ISO 9000 Quality Standards
(b) Debugging Techniques.

****

Code No. D-3772/CBCS

FACULTY OF ENGINEERING

B.E. VII - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Road Safety Engineering

Open Elective - III

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. State the basic concept of road accident statistics?
2. What are the causes of road accidents?
3. What do you understand by code of good practice and checklist?
4. State the Application of computer analysis of accident data.
5. What are Traffic calming schemes?
6. Enlist driver's characteristics influencing road safety.
7. What are the factors affecting signal design?
8. Write various measures taken for road safety.
9. State applications of ITS.
10. Mention characteristics of Traffic Incidents.

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11. (a) Describe in detail about investigations and data collection needed for road accident.
    (b) Explain in detail empirical Bayes method.

12. (a) Explain in detail the principles and procedures followed for safety in road design.
    (b) What is Road Safety Audit? Explain in detail the process of conducting road safety audit.

13. (a) Write short notes on Safety barriers and Traffic aid post.
    (b) Describe role of road markings. Sketch any three road markings with a neat sketch.

14. (a) What are Traffic signals? Briefly discuss factors influencing signal design.
    (b) Write in detail about Parking enforcement and its influence on accidents.

15. Discuss latest tools and various techniques used for road safety and traffic management.

16. (a) Discuss national importance of survival of transportation systems during and after an earthquake.
    (b) Write the importance of ITS in incident management in detail.

17. Write short notes on any TWO of the following:
    (a) Delineators.
    (b) Tidal flow operation.
    (c) Types of Incidents.

**

Code No. D-3773/CBCS

FACULTY OF ENGINEERING

B.E. VII - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Software Engineering

Open Elective – III

Time: 3 hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. Define the following terms:
   (a)Software Quality (b) Software Process.
2. What do you mean by software architecture? Why is it needed? How is it different from software design?
3. What is verification? How is different from validation?
4. What is rick in software? Give an example.
5. What is software requirement specification? What is its significance?
6. Define the following terms: (a) Error (b) Fault (c) Failure.
7. What do you mean by coding? How much time usually does coding take in a project life cycle.
8. List any three differences between testing and debugging.
9. What do you mean by software maintenance? Why it is expensive when compared to software development?
10. What is 'business process reengineering'?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11. Compare and contrast the following software process models:
    (a) Waterfall model (b) Prototype Model (c) Iterative Development.

12. What is "project management process"? Discuss the five phases in detail.

13. Discuss the concept of ATAM analysis method for evaluating software architecture.

14. What is software requirement specification (SRS)? Discuss any one format for documenting SRS. What are the desirable properties of an SRS?

15. Discuss the programming principles and guidelines to be followed for developing quality software.

16. (a) How do you calculate the cyclomatic complexity of the code? Give any three formulae.
    (b) List and briefly explain any three black-box testing techniques.

17. Write short notes on the following:
    (a) Restructuring the Code (b) CMMI (c) PCMM.

*****

Code No. D-3774/CBCS

FACULTY OF ENGINEERING

B.E. VII - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Principles of Electronic Communications
Open Elective – III

Time: 3 Hours **Max. Marks: 70**

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 Distinguish between baseband transmission and broadband transmission.
2 Why QSK is better than PSK?
3 List out the layered architecture of OSI model.
4 What do you mean by Fiber-optic? Explain.
5 Outline the significant characteristics of wireless systems.
6 Classify different types of communication channels.
7 What is Demodulation?
8 Mention the important features of telephone systems.
9 Describe RAKE receiver in CDMA.
10 Explain about TCP transport layer protocol.

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 Explain in detail the block diagram of communication system with relevant sketches.

12 (a) Compare the basic digital modulation techniques.
(b) Explain in detail the generation of BFSK using waveform and figures.

13 (a) With relevant figures, explain the function of data link layer.
(b) Explain in detail the working principle of Ethernet communication.

14 (a) Explain the operating principle of paging system using proper block diagram.
(b) With a neat sketch, explain about cordless telephones.

15 (a) Describe evolution of 1G, 2G and 3G mobile phone systems.
(b) What is Zigbee? Explain in details Zigbee networks.

16 (a) Explain in detail the basic principle of electromagnetic radiation.
(b) Derive the mathematical expression for AM wave.

17 Write short note on
(a) Media Access Control
(b) AMPS
(c) Fiber Optic Cables.

****

Code No. D-3775/CBCS

FACULTY OF ENGINEERING

B.E. VII - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Illumination and Electric Traction Systems
Open Elective – III

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. List out the properties of heating element.
2. Write the equation of Stefans law of heat radiation.
3. List out the interlocking methods for reverse control
4. Discuss the function of overload relay?
5. What are different law of illumination?
6. Define MSCP and MHCP.
7. Explain the rating of batteries
8. List the system of train lighting.
9. What is coefficient of Adhesion?
10. Explain in brief the mechanics of train movement.

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11. (a) Explain in brief, how heating is done in the following cases (i) Resistance heating (ii) Induction heating (iii) Dielectric heating.
    (b) A 4kW, 400 V, 3-phase resistance furnace oven is to have 3-star connected nichrome strip of 0.25 mm thick heating element. If the wire temperature is 1400˚C and that of the charge 1000˚C, estimate the suitable width of the strip. The resistivity of nichrome alloy is 1.016×10^{-6}. Assume the radiating efficiency and emissivity of the element as 0.5 and 0.9 respectively.

12. (a) Explain about reversing the 3 phase induction motor using schematic diagram.
    (b) Explain in detail the float switch and limit switch.

13. (a) (i) A lamp emits a total flux of light of 1500 lumens. What is its MSCP?
    (ii) A plane surface is placed 3 meters from a 200CP uniform source of light. Calculate the intensity of illumination on the surface when it is normal and inclined at 60 degree.
    (b) Explain with neat diagram mercury vapor lamp.

14. (a) The distance between two stations is 1.2 km. A schedule speed of 40 kmph is required to cover that distance. The stop is of 18 seconds duration. The values of the acceleration and retardation are 2 kmphps and 3 kmphps, respectively. Then, determine the maximum speed over the run. Assume a simplified trapezoidal speed – time curve.
    (b) Explain about systems of track electrification.

15. (a) Explain about the BG coach lighting.
    (b) Explain in brief SMF battery.

16. (a) Explain with neat diagram sodium vapor lamp.
    (b) Explain in detail the Lead Acid Battery.

17. Write short note on any two:
    (a) Special requirement of train lighting
    (b) Street lighting and flood lighting.
    (c) DC motor Parallel Control.

****

Code No. D-3776/CBCS

FACULTY OF ENGINEERING

B.E. VII - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Mechatronics
Open Elective - III

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. What is mechanization? Explain.
2. What is the drive mechanism used in conveyor system?
3. Explain about sensors for adaptive control.
4. What are the merits of fluid power control?
5. Explain the use of escapement and sorting devices in automation.
6. Explain how temperature is measured using mechatronics measurement system.
7. Distinguish between NPN transistor and PNP transistor.
8. What is data acquisition system? Explain its use.
9. Differentiate between general purpose and special purpose machine tools.
10. List out the types of valves.

PART – B

Note: Answer any five questions. **(5 x10 = 50 Marks)**

11. (a) Explain the flow chart of mechatronics system.

    (b) What is the purpose of interfacing electrical devices with mechanical system? What are its advantages?

12. (a) Describe the use of feeding and indexing devices in automation.

    (b) Discuss the types of actuators used in mechatronics systems.

13. How do you control the simultaneous operation of a two cylinder hydro-pneumatic circuit? Explain the operation.

14. (a) Explain with neat sketch the use of an operational amplifier as an inverter.

    (b) Difference between Integrated circuit and Digital circuits.

15. Explain the basics of ladder diagram in PLC programming.

16. Why is mechatronics relevant with regard to design of modern CNC machines? Explain in detail.

17. Write short notes on the following:

    (a) Stepper motor in half step mode.

    (b) Micro processor and Micro controller.

**