FACULTY OF ENGINEERING

B.E. (CBCS) VIII-Semester (Civil) (Main & Backlog) Examination, July 2021

Subject: Construction Management and Technology

Time: 2 Hours   Max. Marks: 70

Missing data, if any, may be suitably assumed

PART – A

Note: Answer any Five Questions   (5x2= 10 Marks)

1. What is a miltestone chart?

2. Differentiate clearly the difference between event and activity

3. What is resource smoothing?

4. Explain times network.

5. What is operation research? When do you use it?

6. Write standard form of linear programming

7. Define objective function

8. Explain feasible region

9. Classify construction accidents

10. What are the safety aspects to be followed in demolition of buildings.

PART- B

Note: Answer any Four Questions   (4x15= 60 Marks)

11. a) Explain in briefly the difference between PERT and CPM networks. Explain the circumstances under which one is preferred over the other.
    b) The figure-1 below shows the network for a construction project, with the three time estimates of each activity shown in figure
       Compute (i) Critical path and its standard deviation
       (i)   Probability of completion of project in 40 days
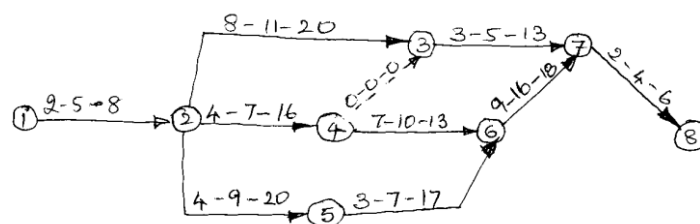   (ii) Time duration that will provide 95% probability of its completion in time.

figure-1

..2

12. The project data is as shown in the below table. The direct costs of the activities are given in table. The indirect cost of the project is Rs. 3000 per Week. Determine the optimum devation of the project and the corresponding minimum cost. Draw time scaled network

Activity	Normal Duration (Weeks)	Normal Cost (Rs.)	Crash Duration (weeks)	Crash Cost (Rs.)
1-2	6	7000	3	14500
1-3	8	4000	5	8500
2-3	4	6000	1	9000
2-4	5	8000	3	15000
3-4	5	5000	3	11000

13. a) When do you prefer graphical method for solving LPP

   b) Find the maximum value of $Z = 2x_2 - x$

   Subject to constraints $x_1 - x_2 \geq -1$

   $$-0.5x_1 + x_2 \leq 2$$

   $$x_2 \leq 2$$

   $$x_1, x_2 \geq 0$$

   Solve the LPP by graphical method.

14. Use simplex method to

   Maximize = $Z = x_1 + 2x_2 + 3x_3 - x_4$

   Subject to the constraints $x_1 + 2x_2 + 3x_3 = 15$

   $$2x_1 + x_2 + 5x_3 = 20$$

   $$x_1 + 2x_2 + x_3 + x_4 = 10$$

   $$x_1, x_2, x_3, x_4 \geq 0$$

15. a) Explain different factors which causes and enhances the chances of accidents
    b) List direct and indirect losses due to accidents

16. a) What are the objectives of construction planning
    b) How cost reduction is done in construction management
    c) How do you recognize optimality in simplex method

17. Prepare a work breakdown structure for construction of a residential building and develop a network. The number of activities should not exceed 20.

****

FACULTY OF ENGINEERING

B.E. (CBCS) (EEE) VIII - Semester (Main & Backlog) Examination, July 2021

Subject: Utilization of Electrical Energy

Time: 2 Hours   Max. Marks: 70

Missing data, if any, may be suitably assumed
PART – A

Note: Answer any Five Questions   **(5x2= 10 Marks)**

1. Name the various resistance welding processes.

2. What are the requirements of welding transformer.

3. What do you understand by push button.

4. Write the advantages of graphite electrodes in EAF.

5. A 200-V lamp takes a current of 1.2 A, it produces a total flux of 2,860 lumens. Calculate the MSCP of the lamp.

6. What is meant by stroboscopic effect in Illumination

7. Define scheduled speed.

8. What is coefficient of adhesion.

9. Mention desirable characteristics of traction motors.

10. What are the different systems of track electrification?

PART- B

Note: Answer any Four Questions   **(4x15= 60 Marks)**

11. a) Explain dielectric heating with neat diagram and derive necessary equations.
    b) Estimate the energy required to melt 500 kg of brass in a single-phase Ajax – Wyatt furnace. If the melt is to be carried out in 3/4 hour, what must be the average power input to the furnace.
    Specific heat of brass = 393 J/kg / ^{0}c
    Latent heat of fusion of brass = 163 x 10^3 J/kg
    Melting point by brass = 920 ^{0}C
    Furnace efficiency = 70%

12. a) Explain jogging operation of 3-phase induction motor with neat schematic diagram.
    b) Explain the applications of
    (i) limit switch   (ii) float switch   (iii) overload relay.

13. a) Explain the Laws of Illumination.
    b) Explain sodium vapour lamp with neat diagram.

..2

14. a) Derive the expression for simplified trapezoidal speed time curve.
    b) An electric train has acceleration and braking retardation of 0.8 kmphps and
       3kmphps respectively. If the ratio of maximum to average speed is 1.3 and time
       for stops 26 seconds, find scheduled speed for a run of 1.5 km. Assume
       simplified trapezoidal speed time curve.

15. a) Explain the suitability of series motor for traction duties.
    b) An electric train weighing 400 tonnes runs a long an up gradient of 1% with
       following speed time curve.
       Uniform acceleration of 1.5 kmphps for 30 sec
       Free running for 36 secs
       Coasting for 25 secs
       Braking at 2.6 kmphps to rest, If tractive resistance is 45 N/Tonne, rotational
       inertia effect 10%, overall efficiency of transmission and motor 75%. Determine
       the specific energy consumption.

16. a) Write short notes on construction of Rousseau diagram.
    b) Pinch effect in Arc furnace and how it is overcome in Ajax-Watt Furnace

17. Write short notes on any the following:
    a) Rating of batteries
    b) Specific energy consumption
    c) Electric Arc Welding

****

FACULTY OF ENGINEERING

B.E. (EIE) VIII - Semester (CBCS) (Main & Backlog) Examination, July 2021

Subject: Advanced Programmable Logic Controller

Time: 2 Hours   Max. Marks: 70

Missing data, if any, may be suitably assumed

PART – A

Note: Answer any Five Questions   **(5x2= 10 Marks)**

1. Discuss the evolution of PLC.
2. List out the applications of PLC.
3. What is the baud rate?
4. List the five major types of arithmetic function.
5. Develop programs for math equation of your choice?
6. List and define the six basic comparison function.
7. Explain the basis of the binary counting system.
8. Describe the operation of SKIP function.
9. Describe the operation of cell control by PLC network
10. What is PID tuning?

PART- B

Note: Answer any Four Questions   **(4x15= 60 Marks)**

11. a) List out the important consideration of program scanning rate and sequence.
    b) What are the major precaution to follow when connecting I/O module.

12. Describe the contact (input) function and coil (output) function of the PLC. Also describe the procedure to install a PLC ON-ORR program with suitable example.

13. a) Describe PLC addition with example.
    b) Two conveyors, A and B, feed a main conveyor, C.A third conveyor, R removes rejects a short distance down the conveyor. The counts for conveyors A,B and Re are each input into holding registers in the PLC. Construct a PLC program to obtain the total output, C. part count.

14. a) Describe the operation JUMP with return function. Apply the SK and SCR functions to operational application.
    b) Explain how subroutine works with suitable example.

15. a) Write short notes on PLC analog Signal Processing with suitable example.
    b) Describe OSI networks.

16. a) Describe a typical PLC Architecture with suitable diagram.
    b) Describe the PLC timer function with examples.

17. Write short notes for following:
    a) Programming formats of PLC
    b) PLC Networking

****

FACULTY OF ENGINEERING
B.E. (M/P) VIII - Semester (CBCS) (Main & Backlog) Examination, July 2021

Subject: Design of Solar Energy System (PE – II)

Time: 2 Hours

Max. Marks: 70

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

PART – A

Note: Answer any five questions. (5x2 = 10 Marks)

1 Explain about Solar Constant.
2 Explain about the solar radiation data.
3 Explain about f-chart calculations.
4 Explain any two non focusing collectors with neat drawings.
5 What are the benefits of thermal energy storage system?
6 What is the energy conservation strategies involved in thermal energy storage system?
7 Explain the need of charge controller.
8 Explain about maximum power point tracker.
9 What are the Hohmeyer categories for consideration in energy and economy?
10 Explain in briefly about the criteria of selection of materials.

PART – B

Note: Answer any four questions. (4x15 = 60 Marks)

11 Explain the major components in design of solar energy system.

12 Derive the thermal performance of solar water heating collector.

13 Explain the design aspects of solar thermal energy storage system.

14 Explain about the software codes used in design of solar thermal system.

15 Explain a case study on solar photovoltaic system.

16 Explain about f-chart method for solar heating system.

17 Explain about
    (a) Cell Temperature
    (b) Swimming pool heating.

****

FACULTY OF ENGINEERING
B.E. (M/P) VIII - Semester (CBCS) (Main & Backlog) Examination, July 2021

Subject: Composite Materials (PE-II)

Time: 2 Hours   Max. Marks: 70

(Missing data, If any, may be suitably assumed)
PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1   Why reinforcements are made in the form of thin fibers?
2   Name some of the natural fibers used in composite materials.
3   Find the in plane shear modulus of unidirectional lamina if Ef = 85 GPa, is Em = 3.4 GPa, $\mu_f = 0.2, \mu_m = 0.3 \ and \ V_f = 0.6$.
4   Derive the density of composite materials in term of density of fiber, density of matrix and mass fraction.
5   Are v_{12} and v_{21} independent of each other for a unidirectional orthotropic lamina?
6   Write the reduced stiffness and the compliance matrix for an isotropic lamina.
7   What is the critical volume fraction of fiber?
8   List the factors that affect the compressive strength of composite materials.
9   What are the assumptions in bending of composite plate?
10 Write the equilibrium equation of composite plate.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) Describe in detail the classification of composite materials.
   (b) Differentiate between thermoplastic and thermoset resin.

12 (a) Derive the longitudinal and inplane shear modulus of composite.
   (b) Explain the variation of transverse stress of fiber reinforce composite.

13 (a) Composite material have the following material properties E_1=140 GPa, E_2= 12 GPa, E_6= 6 GPa and μ_{12}= 0.25. Determine the transfer reduced stiffness matrix for the lamina with ply angle 60°.
   (b) Write the equation for [A], [B] and [D] matrix.

14 (a) Explain in detail the analysis of debonding and fiber pullout phenomena in composite materials.
   (b) Explain in detail the fatigue failure of composite materials.

15 (a) Derive the equilibrium equation of composite plate.
   (b) Explain the levy's solution for bending of composite plate.

16 (a) Explain in detail the fiber-matrix interface of composite materials.
   (b) What are the hygrothermal stresses in composite materials explain in detail?

17 (a) Derive the transfer modulus and major Poisson ratio of composite lamina.
   (b) Explain about the quadratic interaction criteria in composite materials.

****

FACULTY OF ENGINEERING
B.E. (M/P) VIII-Semester (CBCS) (Main & Backlog) Examination, July 2021

Subject: Non-Destructive Testing (Elective – II)

Time: 2 hours   **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 Define non-destructive testing.
2 What are the various characteristics of a penetrant?
3 List out the various magnetizing techniques.
4 State the different display methods.
5 List out the basic properties of sound beam.
6 What is the beam divergence?
7 What are the effect of radiation on the film?
8 Define Film Density.
9 State the basic principle of Acoustic Emission Testing.
10 Write about Neutron Radiography.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) Describe the procedure for Liquid Penetrant Inspection.
   (b) Describe the procedure used for Magnetic Particle Inspection method.

12 (a) Explain the inspection of Ferro magnetic materials by eddy current testing.
   (b) Describe the eddy current flow with different coil arrangements.

13 (a) Explain the demagnetization in magnetic particle testing? How do you ensure it?
   (b) Describe the Ultrasonic Inspection Methods.

14 (a) Explain the principle of neutron radiography and state its applications.
   (b) Describe the basic principle of thermography and state its applications.

15 (a) Explain the production of X-rays.
   (b) Write about the: (i) Film Density (ii) Radiography Sensitivity

16 (a) Explain the various techniques for radiographic inspection.
   (b) Describe the Ultrasonic Flaw detection equipment.

17 (a) State the applications of Non-Destructive Testing.
   (b) List out the needs of the Non-Destructive Testing.

*****

FACULTY OF ENGINEERING
B.E. (A.E.) VIII-Semester (CBCS) (Main & Backlog) Examination, July 2021

Subject: Autotronics (PE-II)

Time: 2 hours   **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions.   **(5x2 = 10 Marks)**

1. What are the different type of actuators used in automobile?
2. Write note on the microprocessor.
3. How Detonation-knock sensor works?
4. What you mean by HT distribution?
5. What is the function of lambda sensors?
6. What are advantages of central control system?
7. List out the components of ABS.
8. What is a function yaw sensor?
9. State four advantages of an intelligent airbag.
10. Write note on Engine immobilizer.

PART – B

Answer any four questions.   **(4x15 = 60 Marks)**

11. Explain various system applications of electronics in automobile with help block diagram.

12. (a) State five advantages of electronic ignition compared with the contract breaker system.
    (b) Draw the circuit diagram of a programmed ignition system and clearly label each part.

13. Explain combined ignition and fuel management system with the help of block diagram.

14. (a) Discuss ECAT with the help of block diagram.
    (b) Explain ABS with the help of block diagram.

15. (a) Describe, with the help of a block diagram, the operation of a cruise control system.
    (b) Describe, with the help of a block diagram, the operation of an Electric seat adjustment.

16. Explain CRDI with help of neat sketch.

17. Write short notes on the following:
    (a) Integrated circuits
    (b) Single point injection
    (c) Electric mirrors

*****

FACULTY OF ENGINEERING
B.E. 4/4 II - Semester (Civil) (Backlog) Examination, July 2021

Subject: Estimating and Specifications

Time: 2 Hours   Max. Marks: 75

Note: Missing data, If any, may be suitably assumed
PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1   Write the standard specification for different items of building construction.
2   Calculate the quantity of arch work in a flat arch over a door of 1.2 m width, thickness of arch is 30cm and the breadth of wall is 30cm?
3   List out various types of contracts.
4   State the principle of earthwork of roads and canals.
5   Write general items of work for Damp=proof course.
6   How do you classify the labour based on skills?
7   What is Security deposit?
8   What are conditions of contract?
9   What do you mean by Lump sum in estimates?
10 What is the Measurement sheet?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 Prepare a detailed estimate for the following items of work for a residential buildings plan shown in Figure 1 using centre-line method.
    (a) Earthwork excavation for foundation
    (b) 1 st class brickwork in superstructure with CM (1:6)

Figure 1

12 (a) Explain in detail the various methods of building estimations.
    (b) Describe the procedure for the calculation of rate per unit Sq.mt of 6 mm thickness plastering, 12mm plastering thickness and 20mm plastering thickness.

13 Compute the quantity of steel reinforcement in an RCC roof slab 4.5m clear span, 7m long and 180mm thick, having 12mm diameter main bars at 15cm c/c and 8mm diameter distribution bars at 20 cm c/c with alternate bars. Also prepare schedule of bars for RCC slab.

14 (a) What do you mean by end anchorage, explain types of end anchorages and explain the proforma of reinforcement Bar Bending Schedule?
   (b) List and explain any four general items of work involved in the estimation for a building along with the process of calculations as per APDSS.

15 (a) Write the specifications for the following items of work:
        (a) D.P.C   (b) Cement concrete flooring.
   (b) What is a Contract? Write in detail any two types of Contracts.

16 (a) Draw the canal sections for the following cases along with usual notations. (a) Fully in excavation   (b) Partly in excavation and partly in embankment.
   (b) Write in detail about Tender documents and Tender Notice.

17 Write short notes on any **TWO** of the following
   (a) Earnest money
   (b) Work Charge Establishment
   (c) Lead and Lift
   (d) Concept of PPP and BOOT project.

****

FACULTY OF ENGINEERING
B.E. 4/4/ (ECE) II-Semester (Backlog) Examination, July 2021

Subject: Data Communication and Computer Networks

Time: 2 hours   **Max. Marks: 75**

Note: Missing data if any, may be suitably assumed.

PART – A

Answer any seven questions.   **(7x3 = 21 Marks)**

1   What are the Network Topologies?
2   Compare Pure ALOHA and Slotted ALOHA
3   Define the term 'Bit Rate'.
4   State phases involved in the operation of HDLC?
5   Distinguish between TCP and UDP.
6   Describe briefly the architecture of ATM
7   What do you mean by framing?
8   What is the function of routing table?
9   Define important aspect of security.
10 Compare SNMP, SMTP protocols.

PART – B

Answer any three questions.   **(3x18 = 54 Marks)**

11 (a) Explain the layers of TCP/IP model.
    (b) Write short notes on packet switching.

12 (a) Explain the concept of Token ring (IEEE 802.5).
    (b) Explain the HDLC frame format.

13 (a) Explain Virtual circuits and datagram network.
    (b) Explain the functions of physical layer and Data link layer in brief.

14 (a) Explain symmetric key algorithm.
    (b) Explain architecture of E-mail and World Wide Web (WWW).

15 (a) Explain the process of Encryption and Decryption with a neat sketch.
    (b) What is IPV6? Explain its advantages over IPH, explain its frame format?

16 (a) Describe architecture of E-mail and World-wide Web (WWW).
    (b) Explain congestion control algorithm.

17 Write short notes on any of the two following:
    (a) Domain Name system
    (b) Application layer protocol
    (c) Cryptography symmetric key

*****

FACULTY OF ENGINEERING
BE 4/4 (Mech. /Prod.) II-Semester (Backlog) Examination, July 2021

Subject: Production and Operations Management

Time: 2 hours   **Max. Marks: 75**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any seven questions.   **(7x3 = 21 Marks)**

1 Differentiate between method study and work measurement.
2 What are the incentives? How these help the production improvement?
3 Compare between single moving average and weighted moving average method of forecasting.
4 Explain multiple regression.
5 What is meant by Enterprise Resource Planning?
6 What is MPS?
7 Write down the expression of economic order quantity defining each term in it.
8 Define term Inventory. State reorder point.
9 Why CPM is called deterministic model and PERT as probabilistic model?
10 Define free float, independent float and total float.

PART – B

Answer any three questions.   **(3x18 = 54 Marks)**

11 Define the term plant layout. What factors influence the design of the layout? State the different types of layout and explain any one with the help of sketch, stating its advantages and limitations.

12 The data given below represents sales figures of Arsh Industries Ltd. for the 12 months of the year 2019.

Month	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Sales	400	490	570	500	640	680	710	800	820	910	860	950

   (i)   Compute the 3 month moving average.
   (ii) Forecast the demand for the month of Jan 2020.
   (iii) If the actual demand for the month of Jan 2020 is 905 units, what should be the forecast for the month of Feb 2020?

13 (a) Discuss briefly about inventory model with price breaks.
   (b) Discuss briefly about inventory models with probabilistic demand.

14 The production manager at Arsh Industries Ltd. wishes to develop a materials requirement plans for producing mobile hand set over an 8 (eight) week period. He estimates that the lead time between releasing an order to the shop floor and producing a finished mobile hand set is 2 (two) weeks. The company currently has 260 mobile hand set in stock and no safety stock. The forecast customer demand is for 150 mobile hand set in week 1 (one), 70 in week 3 (three), 175 in week 5 (five), 90 in week 7 (seven) and 60 in week 8 (eight). Find out the time and size of planned order to develop a Material requirement planning.

15 Draw the network for the following project and compute the critical path time and total float on each activity.

Activity	P	Q	R	S	T	U	V	W	X
Duration (days)	5	4	6	2	1	7	8	4	3
Immediate predecessor	-	-	P	Q	R	R,S	T	U	V,W

16 (a) Explain the various functions of MPS.

(b) A certain item costs Rs.235/- per ton. The monthly requirement is 5 ton and each time the stock is replenished, there is a setup cost of Rs.1000/-. The cost of carrying inventory has been estimated at 10% of the value of the stock per year. What is the optimum order quantity?

17 Write short notes on the following.
    (i) Limitations of ERP
    (ii) Break even analysis
    (iii) Importance of forecasting
    (iv) Standard time Estimation

*****

FACULTY OF ENGINEERING

BE (CSE) 4/4 - II-Semester (Backlog) Examination, July 2021

Subject: Data Mining

Time: 2 Hours   Max marks: 75

Note: Missing data if any, may be suitably assumed

PART - A

Note: **Answer any Seven questions**.   **(7x3=21 Marks)**

1. What is the significance of the Range, Quartiles and Interquartile Range in measuring dispersion of Data?

2. List the methods used to Clean the Data

3. Compare bottom – up and top-down methods of Data warehouse design

4. Differentiate ROLAP and MOLAP Data Mining Servers.

5. List the Objective measures to evaluate Patterns obtained in Association rule mining

6. Differentiate frequent itemset, closed frequent itemset and maximal frequent itemset.

7. Show the working of a classifier with a neat sketch

8. Compare Eager learners and Lazy learners

9. Differentiate Exclusive, Fuzzy and Sharing clustering techniques.

10. Define different types of Outliers.

PART - B

Note: Answer any Three questions.   **(3x18=54 Marks)**

11. a) Compute Euclidean, Manhattan, Cosine and Supremum distance measures between two data objects X and Y define as X = (1, 3, 4, 0, 0, 4, 2, 8, 7), Y = (0, 5, 0, 0, 5, 14, 6, 0, 0).
    b) Explain Data Reduction techniques

12. a) Describe Star Schema to implement Multi-dimensional data model
    b) Explain Attribute-oriented induction for Data Generalization

13. a) Compute frequent itemsets for the following transactional database without candidate generation

Tid	Items
T100	(K,A,D, B)
T 200	(D,A,C,E, B)
T 300	(C,A, B,E)
T400	(B,A,D)

    b) Support in Multilevel Association rule Mining must be reduced as we go down the hierarchy, Justify the statement with suitable examples.

14. a) Compute information gain and Gini index for the following attributes.

A	B	C	Target
T	T	T	YES
T	T	F	No
T	F	T	YES
F	T	T	Yes
F	T	F	No
F	F	F	YES

   b) Explain the role of class independence assumption in Naive Bayesian classification.

15. a) Explain the steps in DBSCAN algorithm to cluster data objects
    b) Describe the significance of sum of the squared error in termination of K-Means algorithm.

16. a) Explain the issues need to be addressed while doing Data integration.
    b) Describe various OLAP operations with an example.

17. Write notes on
    a) Bayesian belief networks
    b) Outlier detection methods

****

FACULTY OF ENGINEERING

B. E. (I.T.) - 4/4 II – Semester (New) (Backlog) Examination, July 2021

Subject: Embedded Systems

Time: 2 hours   Max. Marks: 75

(Missing data, if any, may be suitably assumed)
PART – A

Note: Answer any seven questions.   **(7 x 3 = 21 Marks)**

1. What are the challenges in embedded systems?
2. Give the structure of PSW.
3. Define Task and give task state diagram.
4. Discuss all the arithmetic flags used by 8051.
5. Define CPRS register in ARM processors.
6. What is priority inversion problem? Explain.
7. What are linker and locator?
8. What are semaphores and queues?
9. What is instruction level parallelism? Give an example.
10. What are the problems in shared data? How it can be solved?

PART – B

Note: Answer any three questions.   **(3 x 18 = 54 Marks)**

11. Draw and explain 8051 Architecture.

12. a) List and explain various data transfer instructions in 8051 with example.
    b) Explain different addressing modes of 8051.

13. a) Explain how seven segment display in interfaced to 8051 with suitable example.
    b) What are Message Queues, Mailboxes and Pipes? Explain.

14. a) Discuss soft real time and hard real time systems.
    b) Discuss various ways to get embedded software into target system.

15. a) Discuss features of SHARC processors.
    b) Describe various addressing modes in ARM processor.

16. a) Explain how interrupts are handled in RTOS?
    b) Explain various timer modes of operation in 8051.

17. Write notes on any two of the following
    a) Jump and call instructions.
    b) I2C and CAN bus.
    c) Serial communication modes.

* * *