

XII
25/10/16

S.Y.J.C. (Electronics Technology)

First Terminal examination October 2016

Maximum Marks : 50 Duration 1.5 Hrs

Paper I : Digital and linear Electronics

Q.1) A) Fill in the blanks with an appropriate word (4 M)

- In BCD, the group is in the _____ form (nibble / word)
- _____ is a circuit having one or more inputs and single output (Gate/Adder)
- NAND and NOR gates are called _____ gates (universal /basic)
- MOS device is _____ (Unipolar / Bipolar)

Q.1) B) Match the following (4 M)

- | A | B |
|-------------|----------------------------------|
| i) NOT gate | a) 16 bits |
| ii) Word | b) Many to one |
| iii) MUX | c) Functions opposite to decoder |
| iv) Encoder | d) Single Input single output |

Q.1) C) State whether the following statements are True or false (4 M)

- Decoder is used to convert BCD data into decimal format.
- Speed of digital circuit determines the propagation delay.
- EXOR gate is basic gate.
- The radix of octal number system is 16.

Q. 2) Answer any four questions (4 Marks each) (16 M)

- Convert the following:
i) $(10110.11)_2 = (\quad)_{10}$ ii) $(64)_8 = (\quad)_{10}$.
- Explain AND gate completely.
- Give the logic diagram of EXOR gate and write its truth table.
- Draw the logic diagram of 4 : 1 MUX and explain its working.
- Differentiate between CMOS and TTL.

Q. 3) Answer any four questions (3 marks each) a (12 M)

- Subtract using one's complement : $1000 - 1111$.
- State and explain De Morgans first theorem.
- What is an encoder. Explain it with logic diagram.
- Draw TTL NOT gate.
- Draw the logic diagram $Y = A \cdot B + A \cdot \bar{B}$

17/10/16

1st

XII E.T.-II

S.Y.J.C. (Electronics Technology)
First Terminal examination October 2016
Paper II: Modern Communication

Maximum Marks : 50 Duration 1.5 Hrs

- Q.1) A) Fill in the blanks with an appropriate word (4 M)
- Simplex is _____ way of communication (1 / 2)
 - _____ lines per frame are used for tv scanning in India (312.5/625)
 - The IF of FM is _____ (10.7 MHz/455 KHz)
 - To convert RF signal to IF signal _____ stage is used in a radio receiver (Audio stage / Mixer stage)
- Q.1) B) Match the following (4 M)
- | A | B |
|--------------------------------|------------------------|
| i) TV picture IF | a) Light waves |
| ii) Fibre optic communication | b) 33.4 MHz |
| iii) Super heterodyne receiver | c) De emphasis |
| iv) FM receiver | d) Heterodyning action |
- Q.1) C) State whether the following statements are True or false (4 M)
- AFC is used in AM radio receiver.
 - The width to height ratio of the picture frame in TV is called aspect ratio.
 - In FM the amplitude of the carrier is constant.
 - Modulation solved the problem of interference of audio signal in communication.
- Q. 2) Answer any four questions (4 Marks each) (16 M)
- Explain interlaced scanning in TV with diagram.
 - Draw the block diagram of TRF radio receiver.
 - Define modulation index and side bands in AM.
 - Explain with circuit diagram a discriminator circuit.
 - State advantages of fiber optic communication.
- Q. 3) Answer any four questions (3 marks each) (12 M)
- Compare AM and FM.
 - Explain sensitivity, selectivity, fidelity in radio receiver.
 - Give block diagram of superhet AM radio receiver.
 - Explain VSB in tv transmission.
 - Explain necessity of modulation.

811

ET-III

24/10/16

1st session

S.Y.J.C. (Electronics Technology)
First Terminal examination October 2016
Paper III : Applied Electronics

Maximum Marks : 50 Duration 1.5 Hrs

- Q 1) A) Fill in the blanks with an appropriate word (4 M)
- _____ converts light energy to electrical energy. (Photo cell /LDR)
 - The timing element has a resistor and _____ combination (Inductor / Conductor)
 - _____ is used for controlling various operation of machines from a distance which is wireless (Photo cell / remote control)
 - _____ electrical energy to mechanical energy (Motor / SCR)
- Q.1) B) Match the following (4 M)
- | A | B |
|--------------------|-------------------------|
| i) IC 7447 | a) Motor |
| ii) Photo cell | b) Remote station |
| iii) Back e.m.f. | c) Street light control |
| iv) Ground station | d) Display device |
- Q.1) C) State whether the following statements are True or false (4 M)
- Liquid crystals are simple organic compounds used in LCD.
 - Remote control has only two sections transmitter and receiver.
 - Most of the electronic devisors use DC motors.
 - LDR is always operated in the reversed biased mode.
- Q. 2) Answer any four questions (4 Marks each) (16 M)
- 1) What is photo electric effect. Give its types.
 - 2) Enlist advantages of electronic timers.
 - 3) Give advantages of LED.
 - 4) With neat block diagram explain the working of remote station.
 - 5) Define back e.m.f. and torque.
- Q. 3) Answer any four questions (3 marks each) (12 M)
- 1) Draw an equivalent circuit of DC motor.
 - 2) Explain any one use of remote control in detail.
 - 3) Compare LED and LCD.
 - 4) With the neat diagram explain the working of time delay relay.
 - 5) Write a short note on LDR.

XII

Elect - 19/11/16 IST

Marks 50

STD XII

Electronics PI and P2

Term I Exam

1.30 Hours

- Note: i] All questions are compulsory.
ii] Figures to the right indicate full marks.
iii] Draw neat diagram wherever necessary.
iv] Use of Log table is allowed. Calculator is not allowed
-
-

Q.1 A Select the correct alternative and rewrite the following sub questions. [4]

- i) The average DC output voltage of full wave rectifier is _____
a) V_m/π b) $2V_m/\pi$ c) $4V_m/\pi$ d) None of these.
- ii) Third block in Block diagram of OPAMP is _____
a) Differential Amplifier b) Emitter follower c) Constant current Source d) Level Shifter.
- ii) 16:1 MUX can be designed with _____ select lines
a) 2 b) 4 c) 16 d) 32
- iv) When an odd decimal number is converted into binary number, LSB will be _____.
a) 0 b) 1 c) 2 d) 3

B. Attempt any Two of the following. [6]

- i) Draw basic Time base circuit . What is the use of Blanking circuit?
- ii) Draw variable regulator circuit using IC LM317 and design the regulator for output 12 volts, if $R_1=1K$ Ohm
- iii) Explain working of Zener Voltage Regulator. Is there any short circuit protection provision in it?

Q.2. Attempt any two of the following. [10]

- i) Draw a block diagram of OPAMP and explain the function of each block
- ii) Explain the working of voltage regulator using transistor. How short circuit protection is done?
- ii) Draw the circuit diagram of Non Inverting amplifier and derive the expression for output Voltage.
-
-

Q.3 A] Attempt **any Two** of the following.

[10]

- i) Draw a neat diagram of CRT and state its various electrodes.
- ii) Explain various blocks used in Digital Multi Meter.
- ii) Explain working of "LC" filter.

Q.4. Attempt **any Two** of the following.

[10]

- i) Explain working of 4 bit controlled inverter using X-OR. Draw diagram. Write TT.
- i) Explain working of 4 bit adder/subtractor with the help of circuit diagram.
- ii) What is 2's complement of a binary number? Explain it with suitable example

Q.5) Attempt **any Two** of the following

[10]

i) Convert followings.

$$(BAD)_{16} = (\quad)_2$$

$$(1010110011)_2 = (\quad)_{10}$$

ii) Explain the working of Full adder. Draw neat diagram.

iii) Explain working of 8:1 MUX using two 4:1 Mux.

- NOTE: 1. All questions are compulsory.
 2. Draw neat diagrams wherever necessary.
 3. Figures to the right indicate full marks
 4. Use of any type of calculator is not allowed
 5. Due credit will be given for the programs with appropriate comments
 6. Write both the papers in the same answer sheet

Paper I

Q.1. Answer any two of the following:

10

1. Explain the following OOP concepts with an example of each:
 (i) Inheritance (ii) Polymorphism (iii) Data Abstraction
2. Explain `` and `` tags with suitable Example
3. Write a Short note on Fixed and Variable Partitioning.

Q. 2. Answer any one of the following:

5

1. What is a Class in C++? How are member functions defined inside and outside the Class. Explain with examples.
2. Explain Working with Files with examples.

Q. 3. Answer any two of the following:

10

1. Write a program in C++ to sort the numbers in ascending order using bubble sort technique.
2. Write a program in C++ to reverse a string.
3. Write a Program in C++ to accept a number and test whether it is a Prime Number or not

OR

Q. 3. Answer any two of the following:

10

4. Write a program in C++ to swap two numbers inputted by the user using swap function.
5. Write a C++ Program to replace every space in an inputted string (less than 80 characters) with a hyphen (i.e. -).
6. Write the HTML code for the following output.

		Year		
		1998	1999	2000
Sales	Units	500	400	1000
	Income	1000	800	2000

18/11/16

I wd.

Std. XII.

M.C.V.C.

Marks. 50

Sub. F.C.

Q.No.1.(A) Select the proper option and complete the statement (05)

- 1) Project report is Of proposed plant to be under taken.
(Blue print, written plan, book let)
- 2) Unit that is established by entrepreneur is known by the other name
(Industry, business, business enterprise)
- 3) Selection of place is the decision of importance.
(Secondary, last, major)
- 4) Bank issues against fixed deposit.
(Card, receipt, pass book)
- 5) The principle of Is not applicable in case of life insurance.
(Subrogation, utmost good faith, insurable interest)

(B) Match the pairs (05)

A group

B group

- | | |
|---------------------------------|--|
| 1) Birth date certificate | a) Account of a person is credited. |
| 2) Current account | b) Infrastructure. |
| 3) Crossed cheque | c) Required in case of life insurance. |
| 4) Production cost | d) Traders and businessman. |
| 5) Electricity and water supply | e) Total of all costs. |

(C) State whether the statements are True or False. (05)

- 1) Good and healthy relations between management and employees is a weakness of Business unit.
- 2) Government support to entrepreneurs may be in the form of providing infrastructure facilities.

- 3) Over draft facility is provided to saving account.
- 4) Warehousing and transport comes under the category of infrastructure services.
- 5) Generating the idea for the selection of project is the work under taken by production and Manufacturers.

Q.No.2. Write short notes (any two) (10)

- 1) Factors for selection of project.
- 2) Project appraisal-technical aspect and economic aspect.
- 3) Functions of banks.
- 4) Importance of insurance.

Q.No.3. Write distinguish between (any three) (15)

- 1) Life insurance and fire insurance.
- 2) Saving bank account and fixed deposit account.
- 3) Marine insurance and accident insurance.
- 4) Commercial bank and co-operative bank.

Q.No.4. Write any one from the following. (10)

- 1) Explain elements (steps) of a project report ?
- 2) Write principle of insurance in detail ?

Time : 1 and ½ hours

Marks :50

1. Figures to the right indicates full marks.

2. All questions are compulsory.

3. Draw neat diagrams wherever necessary.

4. Use of logarithmic table allowed.

Q.1. Select the most appropriate answer : (10x1=10)

1. A stone is tied to the string and rotated in an horizontal circle with constant angular velocity. If the string is released, the stone flies

(a) radially inward (b) radially outward (c) tangentially forward (d) tangentially backward

2. The displacement of a particle performing linear S.H.M. of one time period is

(a) a (b) 2a (c) 0 {zero} (d) 4a

3. From the stress against strain graph, the behaviour of the wire between elastic limit and the yield point is

(a) perfectly elastic (b) formation of neck (c) perfectly plastic (d) elastic but with permanent deformation

4. A parallel beam of light traveling in glass is incident obliquely on water surface. After refraction, its width

(a) decreases (b) increases (c) remains the same (d) becomes zero

5. For constructive interference the phase difference between two waves must be

(a) $0, \pi, 2\pi, 3\pi, \dots$ (b) $\pi, 3\pi, 5\pi, 7\pi, \dots$ (c) $0, 2\pi, 4\pi, 6\pi, \dots$ (d) $0, 3\pi, 6\pi, 9\pi, \dots$

6. Kirchhoff's junction law is equivalent to

(a) conservation of energy (b) conservation of charge (c) conservation of electric potential
(d) conservation of electric flux

7. To convert galvanometer into voltmeter ?

(a) large resistance should be connected in series
(b) large resistance should be connected in parallel
(c) low resistance should be connected in series (d) low resistance should be connected in parallel

8. Photocell converts light energy into

(a) mechanical energy (b) sound energy (c) electrical energy (d) heat energy

9. The apparatus used to produce plane polarised light is.....

(a) nicol prism (b) glass prism (c) biprism (d) hollow prism

Q.2. Answer the following questions (any 8) : (8x2=16)

1. Define centripetal force and give its any two examples.
2. Define angular S.H.M. State its differential equation.
3. Distinguish between elastic and plastic body.
4. Draw a neat labelled diagram of reflection of light from a plane reflecting surface on the basis of wave theory.
5. State the conditions necessary for obtaining sharp and steady interference pattern.
6. Draw a neat labelled circuit diagram to determine resistance of a galvanometer using Kelvin's method.
7. Explain how a moving coil galvanometer can be converted into a voltmeter.
8. State Einstein's photoelectric equations. Explain two characteristics on the basis of this equation.
9. A particle performing S.H.M. starts from extreme position. Plot the graph of velocity and displacement against time.
10. A 3m long copper wire is stretched to produce an extension of 0.3 cm. If Poisson's ratio for copper is 0.26, what is the lateral strain produced in the wire.

Q.3. Answer the following questions (any 4) : (4x3=12)

1. The photoelectric work function for a metal is 4.2 eV. If the stopping potential is 3 V, find the threshold wavelength and maximum kinetic energy of emitted electrons. (Velocity of light in air = 3×10^8 m/s, Planks constant = 6.63×10^{-34} Js, Charge on electron = 1.6×10^{-19} C)
2. A voltmeter of resistance 500 Ω can measure a maximum voltage of 5 volt. How can it be made to measure a maximum voltage of 100 volt?
3. State Ampere's circuital law and write its mathematical expression.
4. A steel wire of diameter 1×10^{-3} m is stretched by a force of 20 N. Calculate the strain energy per unit volume. ($Y_{\text{steel}} = 2 \times 10^{11}$ N/m²)
5. The period of a simple pendulum increases by 10% when its length is increased by 21 cm. Find the original length and period of the pendulum. ($g = 9.8$ m/s²)

Q.4. Answer the following questions (any 3) : (3x4=12)

1. An object of 2kg attached to a wire of length 5m is revolved in a horizontal circle. If it makes 60 r.p.m. find, its (a) angular speed (b) linear speed (c) centripetal acceleration (d) centripetal force
2. What is polarisation of light? State and explain Brewster's law.
3. Derive the condition for a balanced Wheatstones Bridge.
4. The potentiometer wire has length 10m and resistance 10 Ω . If the current flowing through it is 0.4 A, what are the balancing lengths when two cells of emf's 1.3 V and 1.1 V are connected so as to
(a) assist and (b) oppose each other?

Q. 4. Answer the following (Any One)

(7)

- i)
 - a) Derive the relationship between relative lowering of vapour pressure and molar mass of nonvolatile solute.
 - b) Derive the relation between ΔH and ΔU .
 - c) What is " ionic solids " .

- ii)
 - a) The molar conductivity of 0.02 M HCl solution is $407.2 \text{ } \Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$ at 25°C . Calculate its conductivity.
 - b) Explain impurity defect in stainless steel with diagram .
 - c) Define
 - 1 Freezing point
 - 2 Electronic conductors

Section 2

Q 5. Select and write the most appropriate answer from the given alternatives for each sub question 6M

- i. The metamer of Ethoxyethane is ____
(a) methyl-n-propylether (b) butan-1-ol
(c) butan-2-ol (d) methoxy methane
- ii. In phenols, the carbon-oxygen bond length is ____
(a) 163pm (b) 133pm
(c) 13×10^2 pm (d) 136pm
- iii. Deaths due to liquor poisoning is mainly because of ____
(a) propanol (b) ethanol
(c) pyridine (d) methanol
- iv. Lucas reagent is a mixture of ____
(a) anhydrous AlCl_3 and HCl (b) anhydrous FeCl_3 and HCl
(c) anhydrous ZnCl_2 and HCl (d) anhydrous ZnSO_4 and H_2SO_4
- v. In SN^1 reaction, in the product there is ____
(a) inversion of configuration (b) retention of configuration
(c) inversion and retention of configuration (d) no racemisation
- vi. In which of the following pairs both are nucleophile ____
(a) BF_3 , AlCl_3 (b) NO^+_2 , Cl^-
(c) CN^- , NH_3 (d) Br^+ , BCl_3

Q 6. Answer any three of the following 6M

- I. How is ethanol prepared from methanal by using Grignard reagent?
- II. Distinguish between SN^1 and SN^2 reactions.
- III. What happens when ____
(a) Cumene hydroper oxide is warmed with dilute H_2SO_4
(b) Diazomethane reacts with propan-1-ol
- IV. Explain the optical activity in case of lactic acid

Q 7. Answer any two of the following 6M

- I. Explain the mechanism for the bimolecular substitution reaction brought about by the nucleophile $(:\text{OH}^-)$ [OR]
Write the mechanism of the action of hydrogen bromide in cold, on tert butyl methyl ether
- II. How is 2-bromopropane prepared from
(a) An alcohol
(b) An alkene
Write structural formula and IUPAC name of Neopentylchloride.
- III. What are the actions of following reagents on carboxylic acid
(a) Bromine in the presence of non aqueous solvent
(b) Acidified sodium dichromate
(c) 10% nitric acid at 298 K temperature

Q 8. Answer any one of the following

7M

1. (a) Write notes on ____
 - (i) Finkelstein reaction
 - (ii) Swarts reaction

(b) State and explain Markownikoff's rule with suitable example

(c) What happens when potassium cyanide and silver cyanide react with methylchloride.

Give important uses of ether.

 2. (a) Why alcohols have higher boiling points than corresponding alkanes.
 - (b) How 2-methyl propan-2-ol is formed from propanone and methyl magnesium iodide
 - (c) Write mechanism of hydration of alkenes
- [OR]
- Write oxidation of tert Alcohol. Give important uses of phenol.

Maths (Sci)
24/10/16
1st session

SYJC [Sc]

SYJC(sc)

MM=50

Maths & Stats

Times = $1\frac{1}{2}$ hours

Q(I). Attempt any three of the following

09

1. In ΔABC prove that $\sin\left(\frac{B-C}{2}\right) = \left(\frac{b-c}{a}\right) \cos\frac{A}{2}$.
2. The cost of four dozen pencils, three dozen pens and two dozen erasers is Rs 60. The cost of two dozen pencils, four dozen pens and six dozen erasers is Rs 90 where as the cost of six dozen pencils, two pens and three dozen erasers is Rs 70. Find the cost of item per dozen.
3. If one of the lines given by $ax^2 + 2hxy + by^2 = 0$ is perpendicular to $px + qy = 18$. Show that $ap^2 + 2hpq + bq^2 = 0$.
4. Write the converse, inverse and contra positive of the follows conditional statements
 - A. if two triangles are congruent then their areas are equal.
 - B. without the truth table prove that $p \wedge (q \vee \sim p) = p \wedge q$.

Q(II). Attempt any four of the follows

16

1. Show that $\sin^{-1}\frac{8}{17} + \sin^{-1}\frac{3}{5} = \sin^{-1}\frac{77}{36}$.
2. Find p and q if the equation $px^2 - 8xy + 3y^2 + 14x + 2y + q = 0$ represent pair of Perpendicular lines.
3. Find the general solution of $\sin 2x + \sin 4x + \sin 6x = 0$.
4. Solve the following equations
 $5x - y + 4z = 5$, $2x + 3y + 5z = 2$ and $5x - 2y + 6z = -1$.
5. Using truth table show the follows stamen patterns are tautologies
 $[p \rightarrow (q \rightarrow r)] \leftrightarrow [(p \wedge q) \rightarrow r]$.

Q(III). Attempt any three of follows

09

1. Examine the continuity of the function

$$f(x) = \frac{e^{5x} - e^{2x}}{\sin 3x} \quad \text{for } x \neq 0$$

for $x=0$ at $x=0$.

2. Find derivative of $e^{\tan x} + (\log x)^{\tan x}$.

3. If $y = 1 + xe^y$, show that $\frac{dy}{dx} = \frac{e^y}{2-y}$.

4. Find the approximate value of $\sqrt{8.95}$

Q(IV). Attempt any four of the following

16

1. A rectangle has an area of 50 sq.cm. Find its dimension for least perimeter.

2. If $f(x) = x^2 + ax + 6$ for $0 \leq x < 2$
 $= 3x + 2$ for $2 \leq x \leq 4$
 $= 2ax + 5b$ for $4 < x \leq 8$ find a and b.

3. Find $\frac{dy}{dx}$ of $\frac{(x+1)}{(x+2)^2 + (x+3)^4}$.

4. Find $\frac{dy}{dx}$, $x = 3\cos t - 2\cos^3 t$, $y = 3\sin t - 2\sin^3 t$.

5. If $y = \sin(m\sin^{-1}x)$ show that $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} + m^2y = 0$.

THE END

I TERMINAL EXAMINATION -2016

Biology -SYJC

Time : 1 1/2 hrs

Max. Marks : 50

- Note :** 1. All questions are compulsory.
2. Answers to the questions in section-I and section-II should be written in TWO separate answer books.
3. Questions from section I attempted in the answer book of section II and vice-versa will not be assessed.
4. Draw neat and labeled diagrams wherever necessary.
5. Figures to right indicate full marks.

SECTION-I

Q1. Select and write the most appropriate answer from the given alternatives for each sub questions. (any 7) (07)

i) Genes located on same locus but show more than two different phenotypes are called _____.

- a) polygenes b) multiple alleles c) co-dominance d) pleiotropic genes

ii) In a dihybrid cross, F₂ generation offsprings show four different phenotypes while the genotypes are _____.

- a) six b) nine c) eight d) sixteen

iii) Which of the following is the smallest RNA? _____.

- a) t-RNA b) m-RNA c) r-RNA d) ds-RNA

iv) Entry of lactose in cell is influenced by _____.

- a) permease b) aldolase c) ligase d) transcription

v) The molecular knives of DNA are _____.

- a) ligases b) polymerases c) endonucleases d) transcriptase

vi) The first transposons were discovered in _____.

- a) corn b) wheat c) rice d) yeast

vii) The internal source of CO₂ in CAM plants is _____.

- a) oxalo-acetic acid b) malic acid c) RUBP d) PEPA