SUBJECT : ENGLISH (SET-I)

Time : 3 hrs. **M.Marks : 100**

General Instructions :

(i) All questions are compulsory.

(ii) You may attempt any section at a time.

(iii) All questions of that particular section must be attempted in the correct order.

(iv) Avoid cutting and overwriting.

SECTION-A (READING) (30 Marks)

Q1. Read the poem given below : (12 marks)

I DREAM'D that as I wander'd by the way
Bare winter suddenly was changed to Spring,
And gentle odours led my steps astray,
Mix'd with a sound of waters murmuring
Along a shelving bank of turf, which lay
Under a copse, and hardly dared to fling
Its green arms round the bosom of the stream,
But kiss'd it and then fled, as Thou mightest in dream.

There grew pied wind-flowers and violets,
Daisies, those pearl'd Arcturi of the earth,
The constellated flower that never sets;
Faint oxlips; tender bluebells, at whose birth
The sod scarce heaved; and that tall flower that wets –
Like a child, half in tenderness and mirth –
Its mother's face with heaven-collected tears,
When the low wind, its playmate's voice, it hears.

And in the warm hedge grew lush eglantine,
Green cow-bind and the moonlight-colour'd May,
And cherry-blossoms, and white cups, whose wine
Was the bright dew yet drain'd not by the day;
And wild roses, and ivy serpentine
With its dark buds and leaves, wandering astray;
And flowers azure, black, and streak'd with gold,
Fairer than any waken'd eyes behold.

And nearer to the river's trembling edge
There grew broad flag-flowers, purple prank'd with white,
And starry river-buds among the sedge,
And floating water-lilies, broad and bright,
Which lit the oak that overhung the hedge
With moonlight beams of their own watery light;
And bulrushes, and reeds of such deep green
As soothed the dazzled eye with sober sheen.

Methought that of these visionary flowers
I made a nosegay, bound in such a way

That the same hues, which in their natural bowers
Were mingled or opposed, the like array
Kept these imprison'd children of the Hours
Within my hand, – and then, elate and gay,
I hasten'd to the spot whence I had come
That I might there present it - O! to Whom?

— *P.B. Shelley*

On the basis of your understanding of the above poem, answer each of the questions given below with the help of the options that follow : (1x4=4)

(a) The poet had dreamt that _____.

(i) bare summer had given way to spring (ii) spring suddenly changed to winter

(iii) summer and winter were together (iv) bare winter had changed to spring

(b) The poet had wandered in his dream _____.

(i) on to a bank of turf

(ii) under the river

(iii) under a copse round the bosom of the stream

(iv) into a dream

(c) What the poet saw growing along the banks were _____.

(i) a variety of flowers (ii) a variety of cows

(iii) his fair eyes awakened (iv) a dazzling of sunshine

(d) The poet imagined that _____.

(i) kept the flowers as a gift

(ii) made the flowers into a nosegay

(iii) the flowers present themselves

(iv) the flowers were opposed to one another

Answer the following questions briefly : (1x6=6)

(e) Where was the poet led in his dream?

(f) Describe two characteristics of the copse.

(g) What was growing in the hedge?

(h) What flowers grew close to the river's edge?

(i) Why did the bulrushes soothe the eye?

(j) Why had the poet hastened back to the spot from where he had come?

(k) Find words from the passage which mean the same as each of the following : (1x2=2)

(i) earth (verse 2) (b) blue (verse 3)

Q2. Read the passage given below: (10)

1. In business, the value of having a mentor is well established. Many companies also have internal mentorship programmes so that young professionals in the company can learn from the veterans in their midst.

2. Despite this acceptance of the necessity of mentorship, creative mentorships are far harder to come by than seems possible. Though India has had a long history of such mentoring, through the guru-shishya parampara prevalent in the arts and crafts learning system in India, the dynamics of

the system is heavily dependent on the whims of the guru or mentor. These people have ranged from strict disciplinarians demanding complete subservience to others who are lackadaisical and unmindful of their responsibilities.

3. To give this ancient tradition a modern twist, the internationally famed watch making company Rolex has initiated the Rolex Mentor and Protégé Arts Intransitive. The Geneva based firm seeks out gifted young artists from around the world and brings them together with establish mentors and maestros in their field, for a year of creative mentoring and collaboration on a one-to-one basis. So far, two Indian mentors have been chosen to guide potential talent among the youth. The internationally renowned sculptor Anish Kapoor and film maker Mira Nair are the two Indians who are currently directing youngsters in their chosen fields. Sadly, they have no Indian protégés so far.

4. The protégés for this scheme are selected by international nominating companies and many of the duos for this programme do not even come from the same continent, or have a common language. This year's programme which culminated in Mexico City, included the Swiss architect Peter Zumthor and a young Paraguan, Gloria Cabral. Though both of them did not speak the same language, they were both engaged in work on a tea chapel in South Korea.

5. When asked about her mentor, Gloria said that a good mentor was someone who not only provided academic knowledge but also guided and inspired one to something which one might not even know could be done. Recipients from the previous years, too expressed similar thoughts. Israeli director Tom Shoval said he had never even dreamt of getting a chance to work with Oscar Award winning director Alejandro Gonzales Inarritu of 'Birdman' fame. He recalls how his mentor took him to the Canadian Rockies to see firsthand the creative process behind his new film 'The Revenant'.

6. Commenting on the experience Shoval said : 'The visit to the set of 'The Revenant' has been the best cinema school, because one could see how Alejandro builds a shot, choreographs and moves all the elements and creates a complex and emotional peak in every frame'.

7. According to the company the aim behind starting such a project was to fill the vacuum that exists in arts philanthropy. Making it global and ensuring that the initiative was not confined to one form of art, the company has been able to serve the arts through many disciplines. Also such initiatives exerted interaction between various artistic disciplines by encouraging various artists to interact between artistic disciplines.

8. Having selected the maestros, a global search is now under way to find suitable protégés for them. Each mentor is also given the opportunity to suggest his nominee from among a list of finalists made by the organizers. Once chosen, every protégé is given a grant of 25,000 Swiss francs during the mentoring year. In addition he or she is also given funds for travelling and other major expenses. Thus the new initiative has become an exciting way of connecting between the talented youth and the seasoned practitioner through as interactive platform.

On the basis of your understanding of the above passage complete the statements given below with the help of option that follow : (1x2=2)

(a) Companies have internal mentorship programmes _____.

(i) so that young professionals can learn from veterans

(ii) as the company has a fair mix of talent

(iii) to propagate their philanthropic programme

(iv) to link with the rest of the world

(b) The global search is now under way to _____.

(i) find placements for the young (ii) find protégés

(iii) locate projects to engage the young (iv) advertise their watches

Answer the following questions briefly : (1x6=6)

(c) What has been the characteristic of Indian gurus?

(d) Name the two Indian mentors chosen so far, by the organization.

(e) Who have been chosen as this year's protégés?

(f) What were Shoval's experience?

(g) What was the aim behind starting such a project?

(h) What are the allowances made to a protégé?

(i) Find words from the passage which mean the same as the following: (1x2=2)

(i) a great performer (para 8) (ii) not showing enough care (para 2)

Q3. Read the following passage carefully and answer the questions given below : (8)

Swami Vivekananda is a striking figure with his turban and his kindly features. On my enquiring as to the significance, if any, of his name, the Swami said, "Of the name by which I am not known, the first word is descriptive of a Sannyasin, or one who formally renounces the world, and the second is the title I assumed - as is customary with all Sannyasins - on my renunciation of the world; it signifies, literally, the bliss of discrimination".

"And what induced you to forsake the ordinary course of the world Swami?" I asked.

"I had a deep interest in religion and philosophy from my childhood", he replied, "and our books teach renunciation as the highest ideal to which man can aspire. It only needed the meeting with a great teacher - Ramakrishna Paramahamsa to kindle in me the final determination to follow the path he himself had trod, as in him I found my highest ideal realised".

"Then did he found a sect, which you now represent"?

"No", replied the Swami quickly. "No, his whole life was spent in breaking down the barriers of sectarianism and dogma. He formed no sect. Quite the reverse. He advocated and strove to establish absolute freedom of thought. He was a great Yogi".

"Then you are connected with no society or sect in this country? Neither Theosophical nor Christian Scientist, nor any other?"

"None whatever!" said the Swami in clear and impressive tones. "My teaching is my own interpretation of our ancient books, in the light which my master shed upon them. I claim no supernatural authority. Whatever in my teaching may appeal to the highest intelligence and be accepted by thinking men, the adoption of that will be my reward". "All religions", he continued, "have for their object the teaching either of devotion, knowledge or yoga, in a concrete form. Now the philosophy of Vedanta is the abstract science which embraces all these methods, and this is that I teach, leaving each one to apply in to his own concrete form. I refer each individual to his own experiences, and where reference is made to books, the latter are procurable, and may be studied by each one for himself. Above all, I teach no authority proceeding from hidden beings speaking through visible agents, any more than I claim learning from hidden books or manuscripts. I am the exponent of no occult societies, nor do I believe that good can come of such bodies. Truth stands on its own authority, and truth can bear the light of day".

"Then you do not propose to form any society, Swami"? I suggested.

"None; no society whatever. I teach only the self, hidden in the heart of every individual and common to all. A handful of strong men knowing that self and living in its light would revolutionize the world, even today, as has been the case by single strong men before, each in his day".

"Have you just arrived from India?", I inquired.

"No", he replied, "I represented the Hindu religion at the Parliament of Religions held at Chicago in 1893. Since then I have been travelling and lecturing in the United States. The American people have proved most interested audiences and sympathetic friends, and my work there has to take root that I must shortly return to that country".

"And what is your attitude towards the western religions, Swami"?

"I propound a philosophy which can serve as a basic to every possible religious system in the world, and my attitude towards all of them is one of extreme sympathy - my teaching is antagonistic to none. I direct my attention to the individual, to make him strong, to teach him that he himself is divine, and I call upon men to make themselves conscious of this divinity within. That is really the ideal-conscious or unconscious - of every religion".

(a) On the basis of your reading of the passage make notes on it, using headings, sub headings and commonly recognized abbreviations (minimum 4). Also supply a suitable title to the passage. (5)

(b) Based on your notes, write a summary of the passage in around 80 words. (3)

SECTION-B (ADVANCED WRITING SKILLS) (30 marks)

Q4. Army Wives Welfare Association (AWWA) is organizing a Ghazal Night by renowned artist Ghulam Ali in the coming month. As the President of the association invite all the members and their families for the event. (50 words) (4)

OR

'Down to Earth' is a fortnightly environmental awareness magazine which is offering a 20 percent discount as well as a gift on an annual subscription. Draft an advertisement for the same in about 50 words.

Q5. Write a letter to the Police Commissioner (Traffic) complaining about the inadequate parking facilities in the Commercial Street area of Bengaluru, which is causing a lot of inconvenience to the people. Also, talk about the suggestions you would like to give to improve the situation. You are Rakesh/ Radhika Garg of House no. 12, Jayanagar, Bengaluru. (6)

OR

You are Nalini/Vishal Raheja, Hostel Warden, Zenith Public School, Kosikalan. Write a letter to The Sales Manager, Bharat Electronics and Domestic Appliances Limited, Kosikalan, placing an order for a few things that you wish to purchase for the hostel. Also ask for the discount permissible on the purchase.

Q6. There is a growing trend among the youth to participate in adventurous activities. Write an article in 150-200 words for your school magazine on why you would prefer to have an adventurous life. (10)

OR

You are Sanjay/Sanjana, a student of DRM Senior Secondary School, Delhi. You have read the news about the inhuman treatment meted out to the new entrants by the seniors in educational institutions. You are shocked to read it. Write an article in 150-200 words on 'The Evil of Ragging in Educational Institutions' to be published in 'The Times of India', Delhi.

Q7. 'The policy of reservations of seats for admission to the professional courses is good for the deprived sections of society'. Write a debate in 150-200 words either for or against the motion. (10)

OR

You were shocked to know the fact that India has the largest number of child workers in the world. As Arun/Anju, write a speech for morning assembly on topic 'Child Labour - a Curse on Childhood'. (150-200 words)

SECTION-C (LITERATURE AND LONG READING TEXT) (40 marks)

Q8. Read the extract given below and answer the questions that follow : (4)

Aunt Jennifer's fingers fluttering through her wool
Find even the ivory needle hard to pull.
The massive weight of Uncle's wedding band
Sits heavily upon Aunt Jennifer's hand.

(i) What does uncle's wedding band symbolize? How does it affect Aunt Jennifer? (2)

(ii) What are the signs of Aunt's Jennifer's frailty? (1)

(iii) Which paradox the poet refers to in the poem 'Aunt Jennifer's Tigers'? (1)

OR

Belled, flowery, Tyrolese valley. Open - handed map
Awarding the world its world. And yet, for these
Children, these windows, not this map, their world,
Where all the future's painted with a fog,
A narrow street sealed in with a lead sky
Far far from rivers, capes, and stars of words.

(i) What does the map on the wall show? (2)

(ii) For these children, why is this map not their world? (2)

Q9. Answer any **FOUR** of the following in 30-40 words each : (3x4=12)

(i) Do you think Pablo Neruda advocates total inactivity and death? Why/why not?

(ii) "We've all got a great deal to reproach ourselves with", said M. Hamel. Comment.

(iii) How did Dr. Sadao ensure that the American sailor left his house but he himself remained safe and secure?

(iv) What was the Dewan's tiger like? How did he take it into the forest?

(v) How does Mr. Lamb keep himself busy when it is a bit cool?

(vi) Is Saheb happy working at the tea stall? Why/why not?

Q10. Answer the following in 120-150 words : (6)

Why did the iron master's invitation to the peddler to spend Christmas Eve with him make him think that he was going to fall into a trap?

OR

Contrast Sophie's world with her fantasies.

Q11. Answer the following in 120-150 words : (6)

How have class distinctions and the indignities heaped upon the oppressed classes been brought out in the childhood accounts of Zitkala-Sa and Bama?

OR

What lapses on the part of the police and the prison authorities helped Evans to escape from the prison?

Q12. Justify the title 'The Strange Man's Arrival'. (120-150 words) (6)

Q13. Everyone who comes in contact with Griffin suffers. Attempt a character sketch of Griffin in the light of this remark. (120-150 words) (6)

ST-XII 11/2016

SUBJECT : BIOLOGY

Time : 3 hrs. M.M.: 70

General Instructions :

(i) There are a total of 26 questions and five sections in the question paper. All questions are compulsory,

(ii) Section-A contains question number 1 to 5, Very Short Answer type questions of one mark each.

(iii) Section-B contains question number 6 to 10, Short Answer type-I questions of two marks each.

(iv) Section-C contains question number 11 to 22, Short Answer type-II questions of three marks each.

(v) Section-D contains question number 23, Value Based Question of four marks.

(vi) Section-E contains question 24 to 26, Long Answer type Questions of five marks each.

(vii) There is no overall choice in the question paper, however an internal choice is provided in one question of two marks, one question of three marks and all three questions of five marks. An examinee is to attempt any one of the questions out of the two given in the question paper with the same question number.

SECTION-A

Q1. State a method of cellular defence which works in all eukaryotic organisms. (1)

Q2. In case of an infertile couple, the male partner can inseminate normally but the mobility of sperms is below 40 percent. Judge, which kind of ART is suited in this situation to form an embryo in the laboratory without involving a donor. (1)

Q3. Mention the uses of cloning vector in biotechnology. (1)

Q4. Name the enzyme and state its property that is responsible for continuous and discontinuous replication of two strands of DNA molecule. (1)

Q5. What is the source of statin? State its action in the human body. (1)

SECTION-B

Q6. How does a restriction endonuclease function? Explain.

OR

How does crylAc gene control the infestation of bollworm in cotton plant? (2)

Q7. Why do moss plants produce very large number of male gametes? Provide one reason. What are these gametes called? (2)

Q8. A young boy when brought a pet dog home started to complain of watery eyes and running nose. The symptoms disappeared when the boy was kept away from the pet.

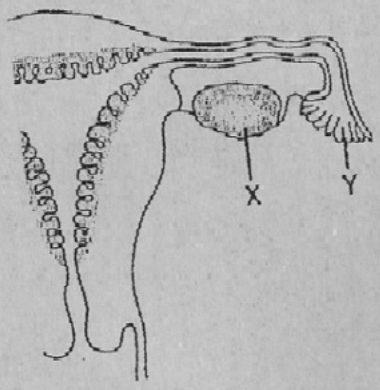
(a) Name the type of antibody and the chemicals responsible for such a response in the boy.

(b) Mention the name of any one drug that could be given to the boy for immediate relief from such a response. (2)

Q9. The diagram below shows a part of human female reproductive system.

(a) Name the gamete cells that would be present in 'X' if taken from a newborn baby.

(b) Name 'Y' and write its function. (2)



(2)

Q10. Name two groups of organisms which constitute 'flocs'. Write their influence on the level of BOD during biological treatment of sewage. (2)

SECTION-C

Q11. (a) Three codons on mRNA are not recognised by tRNA. what are they?

(b) What is the general term used for them?

(c) State their significance in protein synthesis. (3)

Q12. Enlist the steps involved in inbreeding of cattle. Suggest two disadvantages of this practice. (3)

Q13. Explain the interpretation of Charles Darwin when he observed a variety of small black birds on Galapagos Islands. (3)

Q14. Explain the events in a normal woman during her menstrual cycle on the following days :

(a) Pituitary hormone levels from 8 to 12 days.

(b) Uterine events from 13 to 15 days.

(c) Ovarian events from 16 to 23 days. (3)

Q15. (a) Explain any two ways by which apomictic seeds get developed.

(b) How does the pollen tube gain entry into the embryo sac?

OR

Double fertilisation is reported in plants of both, castor and groundnut. However, the mature seeds of groundnut are non-albuminous and castor are albuminous. Explain the post fertilisation events responsible for it. (3)

Q16. (a) Sickle cell anaemia is a result of point mutation. Explain.

(b) Write the genotypes of both the parents who have produced a sickle celled anaemic offspring. (3)

Q17. (a) What is meant by addictive disorder?

(b) Name any two opiate narcotics.

(c) Mention any two ways in which opiate narcotics affect human body. (3)

Q18. (a) Identify 'A', 'B', 'C' and 'D'.

Crop	Variety	Resistance to disease
Wheat	A	Leaf and stipe rust
B	Pusa Shubhra	Black-rot
Cowpea	Pusa Komal	C
Brassica	D	White rust

(b) What is the economic value of Spirulina? (3)

Q19. Suggest and describe a technique to obtain multiple copies of gene of interest in vitro. (3)

Q20. Why are genes encoding resistance to antibiotics considered useful selectable markers for E.coli cloning vector? Explain with the help of an example. (3)

Q21. What does secondary productivity in an ecosystem indicate? List any two factors by which productivity is limited in an aquatic ecosystem. (3)

Q22. Name the host plant and the part that Meloidegyne incognitia infects. Explain the role of Agrobacterium in the production of dsRNA in the host plant. (3)

SECTION-D

Q23. A married couple goes to the hospital for regular checkup of the lady who is pregnant. The man is curious and asks the doctor to tell him the sex of the child. But the doctor refuses.

(a) Did the doctor do the right thing? Which value is being promoted by the doctor?

(b) What is this process of determining the sex of the foetus called?

(c) What would happen if all the doctors do not act in the same manner as mentioned above? (4)

SECTION-E

Q24 (a) Draw a sectional view of a seminiferous tubule of human. Label sertoli cell, spermatogonia and leydig cell on it and write their functions.

(b) Explain the role of pituitary and sex hormones in the process of spermatogenesis.

OR

(a) Draw a labelled longitudinal view of an albuminous seed.

(b) How are seeds advantageous to flowering plants. (5)

Q25. Two blood samples A and B picked up from the cime scene are handed over to the forensic department for genetic fingerprinting. Describe how the technique of genetic fingerprinting is carried out to acertan the identity of the criminal.

OR

Describe the mechanism of inheritance of the ABO system of blood groups, highlighting the principles of genetics involved in it. (5)

Q26. (a) Name the population growth pattern $\left[\frac{dn}{dt} = rN\right]$ represents. What is 'r' in the above equation? Write its importance in population growth.

(b) Explain the principle of carrying capacity by using population Verhulst-Pearl logistic growth curve.

OR

(a) With suitable examples, explain the energy flow through different trophic levels. What does each bar in this pyramid represent?

(b) Write any two limitations of ecological pyramids. (5)

ST-XII 11/2016

SUBJECT : CHEMISTRY (SET-II)

Time : 3 Hrs. **M.M.: 70**

General Instructions :

(i) ***All questions are compulsory.***

(ii) ***Question numbers 1 to 5 are very short answer type questions of 1 mark each.***

(iii) ***Question numbers 6 to 10 are short answer type questions of 2 marks each.***

(iv) ***Question numbers 11 to 22 are also short answer type questions of 3 marks each.***

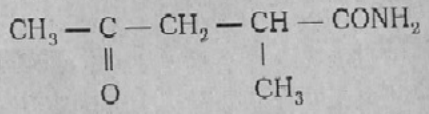
(v) ***Question number 23 is a value based question carrying 4 marks.***

(vi) ***Question numbers 24 to 26 are long answer type questions of 5 marks each.***

(vii) ***Use log tables, if necessary. Use of calculators is not allowed.***

Q1. Why are powdered substances more effective adsorbent than their crystalline forms?

Q2. Write the IUPAC name of the following compound :



Q3. Write the structure of 1-phenylbutan-1-one.

Q4. Arrange the following compounds in an increasing order of their basic strength :-

Aniline, p-nitroaniline, p-toluidine

Q5. What is the effect of Frenkel defect on the electrical conductivity of a solid?

Q6. What is meant by depression in freezing point? Will the depression in freezing point be same if 0.1 mole of sodium chloride or 0.1 mole of glucose is dissolved in one litre of water?

OR

Which colligative property is preferred for the molar mass

Q.7 How are vitamins classified? Name the vitamin responsible For the coagulation of blood.

Q.8 How do antiseptics differ from disinfectants? Give one example for each.

Q9. Complete the following reactions :

(i) $XeF_6 + H_2O \rightarrow$

(ii) $P_4 + SOCl_2 \rightarrow$

Q10. Explain the phenomenon of rusting of iron with the help of chemical reactions involved.

Q11. 0.6 ml of acetic acid (density = 1.06 g ml^{-1}) is dissolved in 1L of water. The depression in freezing point was observed to be 0.205 °C. Calculate the Van't Hoff factor and dissociation constant of the acid.

(K_f for water = 1.86 k kg mol^{-1})

Q12. The electrical resistance of a column of 0.05M NaOH solution of diameter 1 cm and length 50cm is 5.55×10^3 ohm. Calculate its (i) resistivity (ii) conductivity and (iii) molar conductivity.

OR

A copper silver cell is set up. The copper ion concentration in it is 0.10M. The concentration of silver ion is not known. The cell potential measured is 0.422V. Determine the concentration of silver ions in the cell.

(Given $E^\circ_{Ag^+/Ag} = +0.80V$, $E^\circ_{Cu^{2+}/Cu} = +0.34V$)

Q13. Explain the role of -

(i) cryolite in the electrolytic reduction of alumina.

(ii) carbon monoxide in the purification of nickel.

(iii) silica in the extraction of copper from copper pyrites ore.

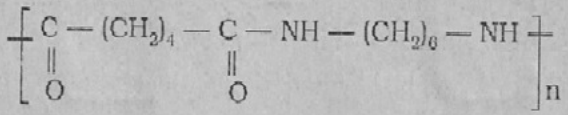
Q14. (a) Give the IUPAC name of $[Pt\ Cl\ (NH_2\ CH_3)\ (H_2O)_2]\ Cl$.

(b) Using Valence bond theory, predict the type of hybridisation, shape and magnetic behaviour of $[Fe(H_2O)_6]^{2+}$.

Q15. (i) Arrange the following in the increasing order of their intermolecular forces :

Nylon-6, Neoprene, PVC

(ii) Identify the monomers in the following polymeric structure :-



(iii) What do you mean by addition polymerisation?

Q16. How will you bring about the following conversions :

(i) Ethanol to propanone

(ii) Nitrobenzene to Chlorobenzene

(iii) Ethanamine to methanamine

Q17. (a) An optically active compound having molecular formula $C_7H_{15}Br$ reacts with aqueous KOH to give a racemic mixture of products. Write the mechanism involved for this reaction.

(b) Why thionyl chloride is preferred for preparing alkyl chlorides from alcohols.

Q18. Give reasons for the following :

(i) The presence of nitro group at o/p positions increases the reactivity of haloarenes towards nucleophilic substitution reactions.

(ii) Dipole moment of phenol is smaller than that of methanol.

(iii) Boiling point of ethanol is higher in comparison to methoxymethane.

Q19. Explain the following reactions with an example of each :

(i) Kolbe's reaction

(ii) Hoffmann's bromamide reaction

(iii) Rosenmund's reduction

Q20. (a) Draw the structures of the following molecules :

(i) XeF_2 (ii) H_3PO_3

(b) Explain, why iron dissolves in HCl to form $FeCl_2$ and not $FeCl_3$?

Q21. How would you account for the following :

(a) F_2 is a stronger oxidising agent than Cl_2.

(b) +3 oxidation state becomes more and more stable from As to Bi in 15^{th} group.

(c) Ozone is thermodynamically less stable than oxygen.

Q22. Give reasons for the following observations :

(i) Cottrell's smoke precipitator is fitted at the mouth of chimney used in factories.

(ii) Physical absorption is multilayered while chemical adsorption is monolayered.

(iii) It is necessary to remove CO when ammonia is obtained by Haber's process.

Q23. The polymers are finding extensive use in our day to day life. Natural polymers are biodegradable but most of the synthetic polymers are non-biodegradable. This is causing a serious environmental problem for the waste disposal. With the increasing use of polymers, the problem of dispersal of waste is also causing alarming curse.

Answer the following questions :

(i) Name one natural polymer and one synthetic polymer which are used as fibres.

(ii) In view of the waste disposal problem, should the manufacture and use of synthetic polymers be banned. Also mention the values associated with your decision.

(iii) Name one synthetic biodegradable polymer.

Q. 24. (a) (i) Explain why Cu^+ ion is not stable in aqueous solution.

(ii) Which is a stronger reducing agent Cr^{2+} or Fe^{2+} and why?

(iii) Explain why Ce^{4+} is a strong oxidising agent?

(b) Complete the following chemical equations :

(i) $MnO_4^- + S_2O_3^{2-} + H_2O \rightarrow$

(ii) $Cr_2O_7^{2-} + H_2S + H^+ \rightarrow$

OR

(a) What is lanthanoid contraction? What are its consequences?

(b) Account for the following :

(i) Zn, Cd and Hg are soft and have low melting points.

(ii) Chemistry of actinoids is much more complicated than that of lanthanoids.

(iii) K_2 (Pt Cl_6) is a well known compouond whereas corresponding compound of nickel is not known.

Q25. (i) Explain, graphically the effect of temperature on the rate constant of the reaction. How can this temperature effect on rate constant be represented quantitatively?

(ii) Rate constant for a first order reaction has been found to be $2.54 \times 10^{-3}\ s^{-1}$. Calculate its three-fourth life.

OR

(a) Define the following terms :

(i) Collision frequency

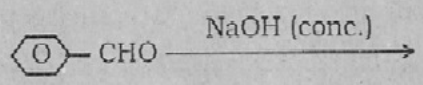
(ii) Rate constant (K)

(b) The rate constant of a first order reaction increases from 4×10^{-2} to 24×10^{-2} when the temperature

changes from 300K to 350K. Calculate the energy of activation (E_a).

Q26. (a) Write the structures of the products of the following reactions :

(i) $CH_3C \equiv CH + H_2O \xrightarrow[\text{dil. } H_2SO_4]{Hg^{2+}}$

(ii)  $\xrightarrow{\text{NaOH (conc.)}}$

(iii) $CH_3COONa \xrightarrow[\Delta]{NaOH/CaO}$

(b) Give a chemical test to distinguish between the following pairs of organic compounds :

(i) Phenol and benzoic acid

(ii) Benzophenone and acetophenone

OR

(a) An organic compound (A) has molecular formula ($C_5H_{10}O$). It does not reduce Tollen's reagent but forms an orange ppt with 2,4-DNP reagent and forms yellow precipitate on treatment with NaOH and I_2. On vigorous oxidation, it gives ethanoic acid and propanoic acid. Identify the structure of A and write the reactions involved.

(b) How are the following conversions carried out?

(i) Toluene to benzaldehyde

(ii) Chlorobenzene to benzoic acid

(c) Arrange : formaldehyde, propionaldehyde, acetone and ethyl methyl ketone in order of increasing reactivity towards HCN.

ST-XII 11/2016

SUBJECT : PHYSICS (SET-II)

Time : 3 Hrs. M.M.: 70

General Instructions :

(i) All the questions are compulsory.

(ii) Question nos. 1 to 5 are very short answer questions, carrying 1 mark each.

(iii) Question nos. 6 to 10 are short answer questions, carrying 2 marks each.

(iv) Question nos. 11 to 22 are also short answer questions, carrying 3 marks each.

(v) Question nos. 23 is a value based question, carrying 4 marks each.

(vi) Question nos. 24 to 26 are long answer questions, carrying 5 marks each.

(vii) There is no overall choice but an internal choice is given in one question of 2 marks, one question of 3 marks and in all questions of 5 marks.

(vii) You may use the following constants :

$c = 3 \times 10^8$ m/s $\quad \epsilon_0 = 8.85 \times 10^{-12}\ Nm^2/c^2$

$\mu_0 = 4\Pi \times 10^{-7}\ TmA^{-1}$ $\quad c = 3 \times 10^8$ m/s

$h = 6.6 \times 10^{-34}\ Js$ $\quad Me = 9.1 \times 10^{-31}$ kg

$M_p = 1.67 \times 10^{-27}$ kg

SECTION-A

Q1. A beam of light converges to a point P. A concave lens of focal length 16 cm is placed in the path of the convergent beam 12 cm from P. At what point does the beam converge now?

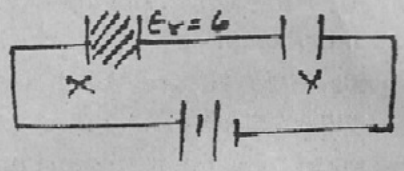
Q2. An alpha particle and a proton are accelerated by the same potential. How are their de-Broglie wavelengths related?

Q3. A nucleus undergoes β^- decay. How does its (i) mass number (ii) atomic number change?

Q4. A circuit component, in an a.c. circuit, causes the current flowing to lead in phase by $\Pi/2$ wrt the applied voltage.

Draw a graph showing variation of the reactance of this component with the frequency of applied voltage.

Q5. In the figure given below, X and Y represent parallel plate capacitors having same area of plates and same separation between their plates. What is the relation between the energies stored in the capacitor?



SECTION-B

Q6. Plot a graph showing the variation of current density (J) with the electric field (E) for two conductors of different materials A and B. What information from this plot regarding the properties of the conducting material, can be obtained which can be used to select suitable materials for making (i) standard resistances and (ii) connecting wires in electric circuits?

Q7. A parallel plate capacitor is charged by a time varying current. Explain briefly, why and how Ampere's circuital law is generalised to incorporate the effect due to the displacement current?

Q8. The energy of an electron in the hydrogen atom is known to be expressible in the form, $E_n = \frac{-13.6Z^2}{n^2}$ eV. Use this expression to show that the

(a) electron in the hydrogen atom cannot have an energy of –2eV,

(b) spacing between the lines (consecutive energy levels) of the observed hydrogen spectrum decreases as n increases.

OR

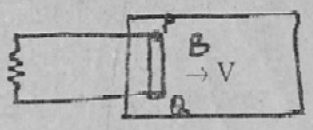
(a) Using Bohr's quantisation of orbital angular momentum, show that the circumference of the n^{th}

orbit in hydrogen atom is n times the de-Broglie wavelength associated with it.

(b) The electron in a hydrogen atom is initially in the third excited state. What is the maximum number of spectral lines which can be emitted when it finally moves to the ground state?

Q9. (a) When a conducting rod PQ of length $l = 10$ cm moves with a uniform speed, $v = 10$ m/s as shown, a 2mA current flows in the resistor of 5Ω. Find the strength of the magnetic field.

(b) If the induced current in the rod is from P to Q, then find the direction of magnetic field.



Q10. Name the phenomenon which is responsible for bending of light around sharp corners of an obstacle. Under what conditions, does this phenomenon take place? Give one application of this phenomenon in everyday life.

SECTION-C

Q11. Electric field amplitude of an EM wave travelling in vacuum is 120 N/C, and its frequency is 50 MHz.

(a) Determine Bo, ω, k and λ.

(b) Which of the answers will change, if the wave travels in a medium of refractive index μ, if E_0 remains same?

Q12. If X_m stands for the magnetic susceptibility of a given magnetic material, identify the class of materials for which (i) $-1 < X_m$ (ii) $0 < X_m < \varepsilon$ (where ε stands for a small positive number)

(a) Write the range in which the relative magnetic permeability of these materials lie.

(b) Draw the pattern of field lines when these materials are placed in a uniform external magnetic field.

Q13. A point charge causes an electric flux -3×10^{-14} Nm^2/C to pass through a spherical Gaussian surface.

(a) Calculate the value of the point charge.

(b) If the radius of the Gaussian surface is doubled, how much flux would pass through the surface?

(c) Find the electric field at surface of the Gaussian surface if its radius is 10 cm.

Q14. Draw a plot of potential energy of a pair of nucleons as a function of their separation. Mark the regions where the nuclear force is (i) attractive (ii) repulsive. Write any two characteristic features of nuclear forces.

OR

Distinguish between nuclear fission and fusion. In a fusion reaction : ${}_1^2H + {}_1^3H \rightarrow {}_2^4He + {}_0^1n$, calculate the amount of energy released in MeV. Given :

$m({}_1^2H) = 2.014102$ u

$m({}_1^3H) = 3.016049$ u

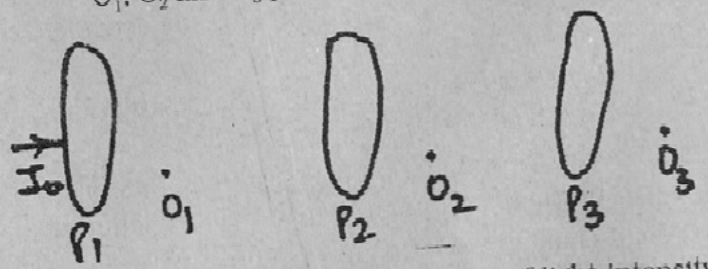
$m({}_2^4He) = 4.002603$ u

$m(n) = 1.008670$ u

$1u = 931.5$ MeV/c^2

Q15. Three identical polaroid sheets P_1, P_2 and P_3 are oriented so that the pass axis of P_2 and P_3 are inclined at 60° and 90° respectively wrt the pass axis of P_1. An unpolarized light wave of intensity I_0 falls on P_1.

(i) Find the intensity of light as observed by observers O_1, O_2 and O_3 positioned as shown.



(ii) Plot a graph showing variation of light intensity as observed by O_2 if the polaroid P_2 is rotated.

Q16. Deduce the expression for the potential energy of a system of two point charges q_1 and q_2 brought from infinity to points r_1 and r_2 respectively in the presence of an external electric field E.

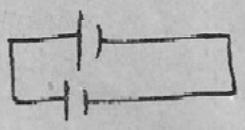
Q17. A beam of monochromatic radiation is incident on a photosensitive surface. Answer the following questions giving reasons -

(i) Do all the emitted photoelectrons have the same kinetic energy?

(ii) Does the kinetic energy of the emitted electrons depend on the intensity of incident radiation?

(iii) On what factors does the number of emitted photoelectrons depend?

Q18. (a) Two cells of emf 10V and 2V and internal resistances 10Ω and 5Ω respectively are connected in parallel as shown. Find the effective voltage and effective internal resistance of the combination.



(b) Draw a graph showing variation of terminal pd across a cell with current when a variable resistor is connected across the cell.

Q19. (i) Draw a ray diagram to show image formation in an astronomical telescope for a distant object.

(ii) How is the working of a telescope different from that of a microscope?

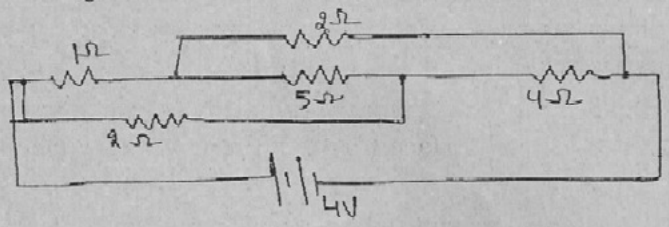
Q20. (i) Why are coherent sources necessary to produce sustained interference?

(ii) Write the expression for the resultant intensity at a point due to the superposition of two monochromatic waves : $y_1 = a\cos\omega t$, $y_2 = b\cos(\omega t + \phi)$, where ϕ is the phase difference between the two waves.

Q21. (i) Write the principle on which potentiometer works.

(ii) Why is the use of potentiometer preferred over voltmeter to measure emf of a cell?

(iii) Calculate the current drawn from the battery in the given network.



Q22. A coil having N turns each of area A, is placed in a uniform horizontal magnetic field, such that the field is perpendicular to the plane of the coil. The coil is rotated about a vertical axis.

(i) Write the expression for the emf induced in the coil in a full rotation. What is the average emf in full rotation?

(ii) Plot graphs showing variations of flux with time and instanteneous induced emf with time.

SECTION-D

Q23. On a hot summer day, while travelling in a bus, Sanjay observed a distant wet patch on the highway. But he did not find any evidene of wetness when he reached that spot. He discussed the matter with his grandfather during evening walk. His grandfather explained the concept and also demonstrated other related activities in front of him.

(a) Name the phenomenon behind this.

(b) What are the necessary conditions for this phenomenon?

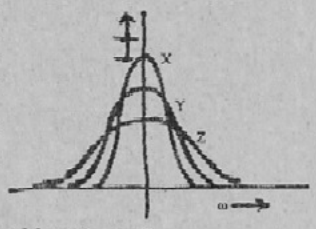
(c) What values are shown by Sanjay and his grandfather.

SECTION-E

Q24. (i) For a given ac, $I = I_0 \sin\omega t$, show that the average power dissipated in a resistor R over a complete cycle is $I_0^2 R/2$.

(ii) Three students X, Y and Z performed an experiment for studying variation of a.c. with angular frequency in a series LCR circuit & obtained the graph as shown.

They all used a.c. sources of the same rms value and inductances of same value. What can we (qualitatively) conclude about the



(a) capcitance value used by them?

(b) resistance value used by them?

(c) In which case will the quality factor be maximum?

OR

(i) Write the principle on which transformer works.

(ii) A small town with a demand of 880 kW of electric power at 200 V is situated 15 km away from an electric power plant generating power at 440V. The resistance of the two wire line is 0.1 Ω/km. The town gets power through a 4400V – 200V step down transformer at a substation in the town.

(a) Calculate the line power loss in the form of heat.

(b) How much power must the plant supply?

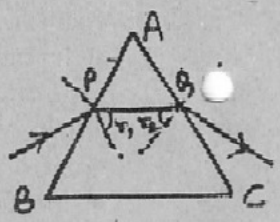
(c) What would be your answer to part (a) if the step down transformer at the substation is of 44000V – 200V. Hence explain the role of transformer in electricity transmission.

Q25. (a) A point object O is kept in a medium of refractive index n_1 in front of a convex spherical surface of radius of curvature R which separates a second medium of refractive index n_2 from the first one. Draw a ray diagram showing the image formation and hence deduce the relation between object distance & image distance in terms of n_1, n_2 and R.

(b) When the image formed above acts as a virtual object for a concave spherical surface separating the medium n_2 from n_1 ($n_2 > n_1$), draw the ray diagram and hence obtain the lens maker's formula.

OR

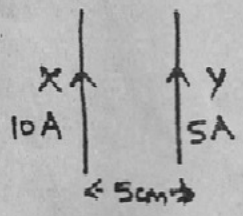
(a) Figure shows a ray of light passing through an equilateral prism. If the ray PQ is parallel to the base BC of the prism, show that (i) $r_1 = r_2$ (ii) angle of minimum deviation, $D_m = 2i - A$.



(b) Using mirror formula, prove that a convex mirror always from a virtual image.

Q26. (a) Obtain an expression for the force experienced by a unit length of a current carrying conductor placed close to another infinitely long straight current carrying conductor.

(b) Calculate the force experienced by 20 cm long conductor Y due to infinitely long X as shown.



(c) On its basis define 1A of current.

OR

Write the relation for the force $\vec{F}$ acting on a charge q moving with a velocity $\vec{V}$ through a magnetic field $\vec{B}$ at an angle θ with the direction of field. Deduce the conditions under which force will be (i) maximum (ii) minimum. In the expression, identify the pairs of vectors that are always perpendicular to each other if the charge moves undeflected due to crossed electric and magnetic fields, then find the relation between the magnitudes of $\vec{E}$, $\vec{B}$ and $\vec{V}$.

ST-XII 11/2016

SUBJECT : COMPUTER SCIENCE (SET-I)

Time : 3 Hrs. **M.M.: 70**

General Instructions :

(i) All questions are compulsory

(ii) Programming Language : C++

Q1. (a) What is abstraction? Explain with an example. (2)

(b) Which C++ header file(s) will be included to run/ execute the following C++ code? (1)

```
void main( )
{  int Last = 26.5698742658;
   cout<<setw(5)<<setprecision(9)<<Last;
}
```

(c) Deepa has just started working as a programmer in STAR SOFTWARE company. In the company she has got her first assignment to be done using a C++ function to find the smallest number out of a given set of numbers stored in a one-dimensional array. But she has committed some logical mistakes while writing the code and is not getting the desired result. Rewrite the correct code underlining the corrections done. Do not add any additional statements in the corrected code. (2)

```
int find (int a[ ], int n)
{ int s = a [0];
for (int x=1; x<n; x++)
if (a[x]>s)
a[x]=s;
}
```

(d) Find and write the output of the following C++ program code : (Note : Assume all required header files are already included in the program). (2)

```
typedef char STRING [80];
void MIXITNOW(STRING S)
{
for (int Size=0; S[Size]!='\0'; Size++);
```

```
for (int I=0; I<Size-1; I+=2)
{
char WS=S[I];
S[I]=S[I+1];
S[I+1]=WS;
}
for (1=1; I<Size; I+=2)
if (S[1]>='M' && S[I]<='U')
S[I]= ' ';
}
void main( )
{
STRING Word="CRACKAJACK";
MIXITNOW(Word);
cout<<Word<<endl;
}
```

(e) Write the output of the following C++ program code : (Note : Assume all required header files are already being included in the program). (3)

```
class Calc
{
char Grade;
int Bonus;
public:
Calc( ) {Grade = 'E'; Bonus = 0;}
void Down (int G)
{
Grade-=G;
}
void Up(int G)
{
Grade+=G;
Bonus++;
}
void Show( )
{
cout<<Grade<<"#"<<Bonus<<endl;
}
```

```
};
void main( )
{
Calc C, D;
C.Down(2);
C.Show( );
D.Show( );
C.Up(7);
D.Up(2);
C.Show( );
D.Show( );
D.Down(3);
C.Up(7);
C.Show( );
C.Down(2);
C.Show( );
D.Show( );
}
```

(f) Study the following program and select the possible output(s) from the options (i) to (iv) following it. Also, write the maximum and the minimum values that can be assigned to the variable NUM. (2)

Note :

- Assume all required header files are already being included in the program.
- random(n) function generates an integer between 0 and n – 1.

```
void main( )
{
   randomize( );
   int NUM;
   NUM=random(3)+2;
   char TEXT[ ]="ABCDEFGHIJK";
   for (int I=1; I<=NUM; I++)
   {
      for (int J=NUM; J<=7; J++)
         cout<<TEXT[J];
```

```
        cout<<endl;
    }
}
```

(i)
```
FGHI
FGHI
FGHI
FGHI
```

(ii)
```
BCDEFGH
BCDEFGH
```

(iii)
```
EFGH
EFGH
EFGH
EFGH
```

(iv)
```
CDEFGH
CDEFGH
```

Q2. (a) What is a copy constructor? Give a suitable example in C++ to illustrate with its definition within a class and a declaration of an object with the help of it. (2)

(b) Observe the following C++ code and answer the questions (i) and (ii) : (2)

```
class Traveller
{
long PNR;
char TName[20];
public :
Traveller( )                                    //Function 1
{ cout<<"Ready"<<endl;}
void Book(long P, char N[ ])                    //Function 2
{PNR = P; strcpy(TName, N);}
void Print( )                                   //Function 3
{ cout<<PNR<<TName<<endl;}
~Traveller( )                                   //Function 4
{cout<<"Booking cancelled!"<<endl;}
};
```

(i) Fill in the blank statements in Line 1 and Line 2 to execute Function 2 and Function 3 respectively in the following code :

```
void main( )
{
Traveller T;
_____//Line 1
_____//Line 2
```

}//Stops here

(ii) Which function will be executed at }//Stops here? What is the function referred as?

(c) Write the definition of a class PIC in C++ with following description : (4)

Private Members

- Pno//Data member for Picture Number (an integer)
- Category//Data member for Picture Category (a string)
- Location//Data member for Exhibition Location (a string)
- FixLocation( )//A member function to assign Exhibition Location as per category
  //as shown in the following table

Category	Location
Classic	Delhi
Modern	Mumbai
Antique	Kolkata

Public Members

- Enter( )//A function to allow user to enter values //Pno, category and call FixLocation( ) function
- SeeAll( )//A function to display all the data members

(d) Answer the questions (i) to (iv) based on the following: (4)

```
class Exterior
{
int OrderId;
char Address[20];
protected :
float Advance;
public :
Exterior( );
void Book( ); void View( );
};
class Paint:public Exterior
{
```

```
int WallArea, ColorCode;
protected :
char Type;
public :
Paint( );
void PBook( );
void PView( );
};
class Bill : public Paint
{
float Charges;
void Calculate( );
public :
Bill( );
void Billing( );
void Print( );
};
```

(i) Which type of Inheritance out of the following is illustrated in the above example?

- Single Level Inheritance
- Multi Level Inheritance
- Multiple Inheritance

(ii) Write the names of all the data members, which are directly accessible from the member functions of class Paint.

(iii) Write the names of all the member functions, which are directly accessible from an object of class Bill.

(iv) What will be the order of execution of the constructors and destructors, when an object of class Bill is declared?

Q3. (a) An double array A[30][40] is stored along the column in the memory. If the element A[20][25] is stored at 50000, find out the location of A[25][30]. (3)

(b) Write the definition of functions for the linked implemented queue containing passenger information as follows : (4)

```
struct NODE
{   int Ticketno;
    char PName[20];
    NODE * NEXT;
};
class Queueofbus
{   NODE *Rear, *Front;
    public :
        Queueofbus( )
        { Rear = NULL;
        Front = NULL; };
        void Insert( );
        void Delete( );
        ~Queueofbus( )
        { cout<<"Object destroyed";}
};
```

(c) Write a function in C++ TWOTOONE( ) which accepts two array X[ ], Y[ ] and their size n as argument. Both the arrays X[ ] and Y[ ] have the same number of elements. Transfer the content from two arrays X[ ], Y[ ] to array Z[ ]. The even places (0, 2, 4...) of array Z[ ] should get the contents from the array X[ ] and odd places (1, 3, 5...) of array Z[ ] should get the contents from the array Y[ ]. (3)

(d) Write a function NewMAT (int A[ ] [ ], int r, int c) in C++, which accepts a 2d array of integer and its size as parameters divide all those array elements by 6 which are not in the range 60 to 600 (both values inclusive) in the 2d Array. (2)

(e) Evaluate the following postfix expression using stack and show the contents after execution of each Operations : 470, 5, 4, ^, 25, /, 6, *, + (2)

Q4. (a) Observe the program segment given below carefully and fill the blanks marked statement 1 and statement 2. (1)

```
class PracFile
{ int Pracno;
```

```
    char PracName[20];
    int TimeTaken;
    int Marks;
    public :
    void EnterPrac( );//function to enter PracFile details
    void ShowPrac( );//function to display PracFile details
    int RTime( )//function to return TimeTaken
    { return TimeTaken;}
    void Assignmarks (int M)//function to assign Marks
    { Marks = M;}
    };
    void AllocateMarks( )
    { fstream File;
    File.open ("MARKS.DAT", ios::binary|ios::in|ios::out);
    PracFile P;
    int Record = 0;
    while (File.read((char*) &P, sizeof(P)))
    {
    if (P.RTime( )>50)
    P.Assignmarks(0)
    else
    P.Assignmarks(10)
    _____//statement 1
    _____//statement 2
    Record++;
    }
    File.close( );
    }
```

If the function AllocateMarks( ) is supposed to Allocate Marks for the records in the file MARKS.DAT based on their value of the member TimeTaken. Write C++ statements for the statement 1 and statement 2, where, statement 1 is required to position the file write pointer to an appropriate place in the file and statement 2 is to perform the write operation with the modified record.

(b) Given a binary file "BUS.DAT", containing records of the following class bus type. (3)

```
class bus
{ int bus_no;
char desc[40];
int distance; //in km
public :
void read( )
{ cin>>bus_no; gets(desc); cin>>distance; }
void display( )
{ cout<<bus_no; puts(desc); cout<<distance; }
int retdist( )
{ return distance; }
};
```

Write a function in C++ that would read the contents of file "BUS.DAT" and display the details of those buses which travels the distance more than 100 km.

(c) Write a function RevText( ) to read a text file "Input.txt" and Print only word starting with 'I' in reverse order. (2)

Example : If value in text file is : INDIA IS MY COUNTRY

Output will be : AIDNI SI MY COUNTRY

Q5. (a) What do you understand by the terms Alternate key and Foreign Key of a relation? (2)

(b) Consider the following table Organisation and Grossincome and answer (I) and (II) part of the question :

Table : ORGANISATION

ECODE	NAME	POST	SGRADE	DOJ	DOB
2001	AJAY	GENERAL MANAGER	D003	23-Mar-2003	13-Jan-1980
2002	VIJAY	EXECUTIVE MANAGER	D002	12-Feb-2010	22-Jul-1987
2003	RAM	DEPUTY MANAGER	D003	24-Jan-2009	24-Feb-1983
2004	RAHIM	PROD. INCHARGE	D002	11-Aug-2006	03-Mar-1984
2005	ABBAS	ADD. GENERAL MANAGER	D001	29-Dec-2004	19-Jan-19832

Table : GROSSINCOME

SGRADE	SALARY	HRA
D001	56000	18000
D002	32000	12000
D003	24000	8000

(I) Write SQL commands for the following statements : (4)

(i) To display the details of all MEMBERS OF ORGANISATION in descending order of DOJ.

(ii) To display NAME and POST of those MEMBERS whose SGRADE is either D002 or D003.

(iii) To display the content of all the ORGANISATION table, whose DOJ is in between 09-Feb-2006 and 08-Aug-2009.

(iv) To add a new row with the following :

2007, 'RUDRA', 'SALES INCHARGE', 'D002', '26-Sep-2011', '26-Sep-1983'

(II) Give the output of the following SQL queries : (2)

(i) SELECT COUNT (SGRADE), SGRADE FROM ORGANISATION GROUP BY SGRADE;

(ii) SELECT MIN(DOB), MAX(DOJ) FROM ORGANISATION;

(iii) SELECT NAME, SALARY FROM ORGANISATION O, GROSSINCOME G WHERE O.SGRADE = G.SGRADE AND O.ECODE<2003;

(iv) SELECT SGRADE, SALARY+HRA FROM GROSSINCOME WHERE SGRADE='D002';

Q6. (a) State and Verify Distributive Law. Verify using Truth Table. (2)

(b) Represent the Boolean expression $yz+xz$ with the help of NAND gates only. (2)

(c) Obtain simplified form for a Boolean expression. (3)
$F(x, y, z, w) = \Sigma (1, 3, 4, 5, 7, 9, 11, 12, 13, 15)$ using K Map.

(d) Write SOP form of Function F(x, y z) whose truth table representation is given below : (1)

x	y	z	F
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

Q7. (a) Compare any two Switching techniques. (1)

(b) Which of the following is not a Client Side script; (1)

(i) VB Script (ii) Java Script

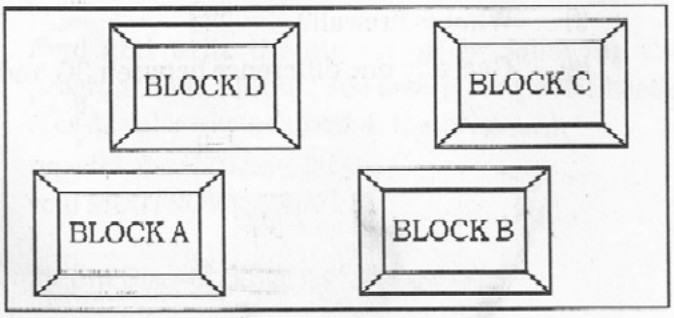
(iii) ASP (iv) PHP

(c) If someone has hacked your Website, to whom you lodge the Complain? (1)

(d) Expand the following : (1)

(i) GPRS (ii) CDMA

(e) ABC Sysems Organisation has set up its new center at Jabalpur for its office and web based activities. It has 4 blocks of buildings as shown in the diagram below : (4)



a

Center to center distance between various blocks

Block A to Block B	80 m
Block B to Block C	250 m
Block C to Block D	50 m
Block A to Block D	190 m
Block B to Block D	125 m
Block A to Block C	90 m

Number of Computers

Block A	25
Block B	50
Block C	150
Block D	10

(i) Suggest a cable layout of connections between the blocks.

(ii) Suggest the most suitable place (i.e. block) to house the server of this organization with a suitable reason.

(iii) Suggest the placement of the following devices with justification

(a) Repeater (b) Hub/Switch

(iv) The organisation is planning to link its International Office situated in Mumbai, which wired communication link, you will suggest for a very high speed connectivity?

(f) What is firewall? (1)

(g) Give any one difference between 3G and 4G. (1)