SUMMATIVE ASSESSMENT- II, MARCH-2017

CLASS - X
SUBJECT - SCIENCE (THEORY)

Time : 3 hours.   M.M : 90

General Instructions :

i)   The question paper comprises of two Sections, A and B. You are to attempt both the sections.

ii)   All questions are compulsory.

iii)   There is no choice in any of the questions.

iv)   All questions of Section- A and all questions of Section-B are to be attempted separately.

v)   Question numbers 1 to 3 in Section- A are one mark questions. These are to be answered in one word or in one sentence.

vi)   Question numbers 4 to 6 in Section- A are two marks questions. These are to be answered in about 30 words each.

vii)   Question numbers 7 to 18 in Section-A are three marks questions. These are to be answered in about 50 words each.

viii)   Question numbers 19 to 24 in Section-A are five marks questions. These are to be answered in about 70 words each.

ix)   Question numbers 25 to 33 in Section-B are multiple choice questions based on practical skills. Each question is a one mark question. You are to select one most appropriate response out of the four provided to you.

x)   Question numbers 34 to 36 in Section- B are questions based on practical skills and are two marks questions. These are to be answered in about 30 words each.

SECTION - A

1. Write the next homologue of each of the following: (1)

   i) C_2H_4 ii) C_4H_6

2. Name the part of Bryophyllum where the buds are produced for vegetative propagation.

3. List two natural ecosystems. (1)

4. State two positions in which a concave mirror produces a magnified image of a given object. List two differences between the two images.

5. List four advantages of properly managed watershed management. (2)

6. Explain giving example where active involvement of local people leads to efficient management of forest. (2)

7. What are covalent compounds? How are they different from ionic compounds ? List their three characteristic properties. (2)

8. When ethanol reacts with ethanoic acid in the presence of conc. H_2SO_4, a substance with fruity smell is produced. Answer the following: (2)

   i) State the class of compounds to which the fruity smelling compounds belong. Write the chemical equation for the reaction and the chemical name of the product formed.

   ii) State the role of con. H_2SO_4 in this reaction.

9. Calcium is an element with atomic number 20. Stating reason, answer each of the following questions: (2)

   i) Is calcium a metal or non-metal ?

ii) Will its atomic radius be larger or smaller than that of potassium with atomic number 19 ?

iii) Write the formula of its oxide.

10. An element 'M' with electronic configuration (2, 8, 2) combines separately with $(NO_3)^-$, $(SO_4)^{2-}$ and $(PO_4)^{3-}$ radicals. Write the formula of the three compounds so formed. To which group and period of the Modern Periodic Table does the element 'M' belongs? Will 'M' form covalent or ionic compounds? Give reason to justify your answer.

11. How do organisms, whether reproduced asexually or sexually maintains constant chromosome number through several generations? Explain with the help of suitable example.

12. Name the parts A, B and C shown in the following diagram and state one function of each.
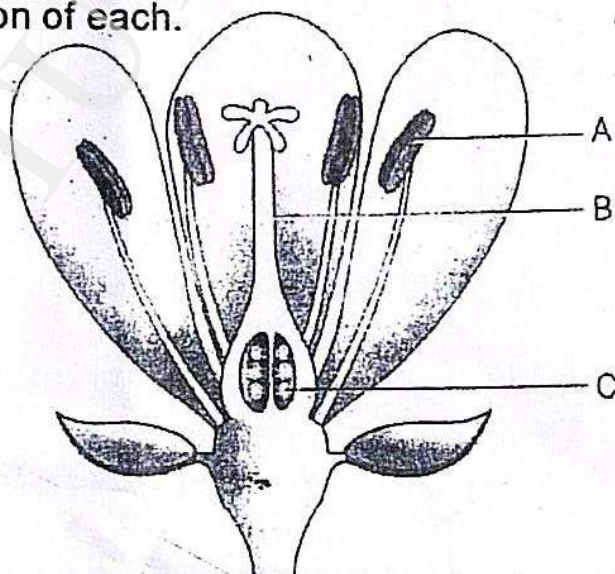

13. Suggest three contraceptive methods to control the size of human population which is essential for the health and prosperity of a country. State the basic principle involved in each.

14. In one of his experiments with pea plants Mendel observed that when a pure tall pea plant is crossed with a pure dwarf pea plant, in the first generation, F_1 only tall plants appear.

a) What happens to the traits of the dwarf plants in this case ?

b) When the F_1 generation plants were self-fertilised, he observed that in the plants of second generation, F_2 both tall plants and dwarf plants were present. Why it happened? Explain briefly.

15) List three distinguishing features, in tabular form, between acquired traits and the inherited traits.

16. Draw the following diagram, in which a ray of light is incident on a concave/convex mirror, on your answer sheet. Show the path of this ray, after reflection, in each case.
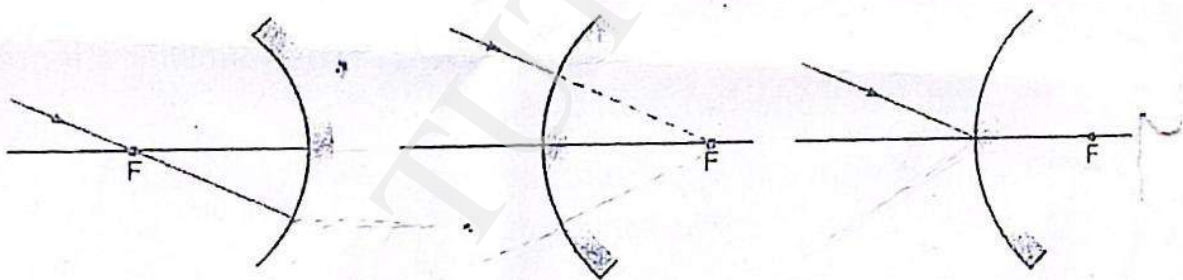
17. Why does the sun appear reddish early in the morning ? Will this phenomenon be observed by an observer on the moon ? Justify your answer with a reason.

18. Give reason to justify the following:

a) The existence of decomposers is essential in a biosphere.

b) Flow of energy in a food chain is unidirectional.

c) List two natural ecosystems.

19. a) Give a chemical test to distinguish between saturated and unsaturated hydrocarbon.

   b) Name the products formed when ethane burns in air. Write the balanced chemical equation for the reaction showing the types of energies liberated.

   c) Why is reaction between methane and chlorine in the presence of sunlight considered a substitution reaction ?

20. a) Write the functions of the following parts in human female reproductive system ?

   i) Ovary   ii) Oviduct

   iii) Uterus

   b) Describe the structure and function of placenta.

21. What is meant by speciation ? Explain briefly any four factors that can lead to speciation. Which of these cannot be a major factor in the speciation of a self-pollinating plant species ? Give reason to justify your answer.

22. a) Define the following terms in the context of spherical mirrors:

   i) Pole   iii) Centre of curvature

   ii) Principal axis   iv) Principal focus

   b) Draw a ray diagram to show the principal focus of a:

   i) Concave mirror   iii) Convex mirror

   c) Define one dioptre of power of a lens.

23. a) Draw a ray diagram to show the formation of image by a convex lens when an object is placed in front of the lens between its optical centre and principal focus.

b) In the above ray diagram mark the object-distance (u) and the image distance (v) with their proper signs (+ve or -ve as per the new Cartesian sign convention) and state how these distances are related to the focal length (f) of the convex lens in this case.

c) Find the power of a convex lens which forms a real, and inverted image of magnification -1 of an object placed at a distance of 20 cm from its optical centre.

24. a) Write the function of each of the following parts of human eye:

Cornea; iris; crystalline lens; ciliary muscles.

b) Millions of people of the developing countries of world are suffering from corneal blindness. These person can be cured by replacing the defective cornea with the cornea of a donated eye. A charitable society of your city has organised a campaign in your neighbourhood in order to create awareness about this fact. If you are asked to participate in this mission how would you contribute in this noble cause?

i) State the objective of organising such campaigns.

ii) List two arguments which you should give to motivate the people to donate their eyes after death.

iii) List two values which are developed in the persons who actively participate and contribute in such programmes.

25. Which of the following sets of materials can be used for conducting a saponification reaction for the preparation of soap

    a) $Ca(OH)_2$ and neem oil

    b)   NaOH and neem oil

    c)   NaOH and mineral oil

    d) $Ca(OH)_2$ and mineral oil

26. A student takes four test tubes marked P, Q, R and S of 25mL capacity and fill 10 mL of distilled water in each. He dissolves one spoon full of four different salts in each as KCl in P, Nacl in Q, $CaCl_2$ in R and $MgCl_2$ in S. He then adds about 2 mL of a sample of soap solution to each of the above test tubes. On shaking the contents of each of the test tubes, he is likely to observe a good amount of lather (foam) in the test tubes marked:

    a)   P and Q   b)   R and S

    c)   P, Q and R   d)   P, Q and S

27. Consider the following comments about saponification reaction:

    I.   Heat is evolved in these reactions

    II.   For quick precipitation of soap sodium chloride is added to the reaction mixture

    III. Saponification reaction is a special kind of neutralisation reaction.

    IV.   Soaps are basic salts of long chain fatty acids

    a)   I, II and III   b)   II, III and IV

    c)   I, II and IV   d)   Only I and IV

28. A student has to perform the experiment "To identify the different parts of an embryo of a dicot seed." Select from the following an appropriate group of seeds:

    a) Pea, gram, wheat

    b) red kidney bean, maize, gram

    c) maize, wheat, red kidney bean

    d) red kidney bean, pea, gram

29. Which of the following is a correct set of homologous organs?

    a) Forelimbs of frog, bird and lizard

    b) Spine of cactus and thorn of bougainvillea

    c) Wings of bat and wings of butterfly

    d) Wings of a bird and wings of a bat

30. A student obtained sharp image of a candle flame placed at the distant end of the laboratory table on a screen using a concave mirror to determine its focal length. The teacher suggested him to focus a distant building about 1 km from the laboratory, for getting more correct value of the focal length. In order to focus the distant building on the same screen, the student should slightly move the:

    a) Mirror away from the screen

    b) Screen away from the mirror

    c) Screen towards the mirror

    d) Screen towards the building

31. To determine the approximate focal length of the given convex lens by focussing a distant object (say, a sign board), you try to focus the image of the object on a screen. The image you obtain on the screen is always:

   a) erect and laterally inverted

    b) erect and diminished

c)   inverted and diminished

d)   virtual, inverted and diminished

32.   Select from the following the best experimental set-up for tracing the path of a ray of light passing through a rectangular glass slab
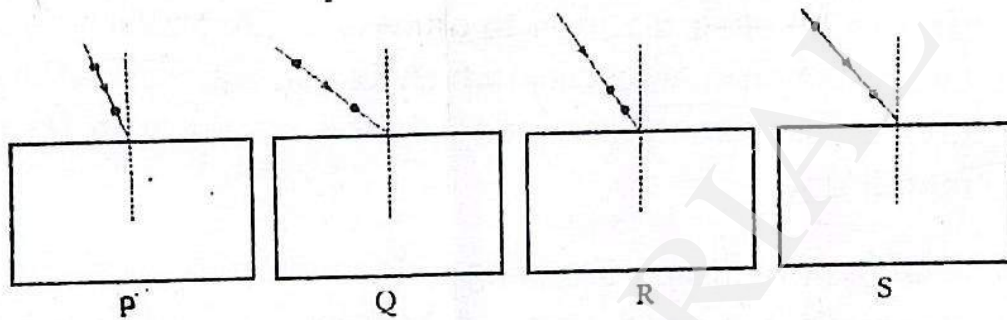
a)   P   b)   Q

c) . R   d)   S

33.   Study the following figure in which a student has marked the angle of incidence (∠i), angle of refraction (∠r), angle of emergence (∠e), angle of prism (∠A) and the angle of deviation (∠D). The correctly marked angles are:
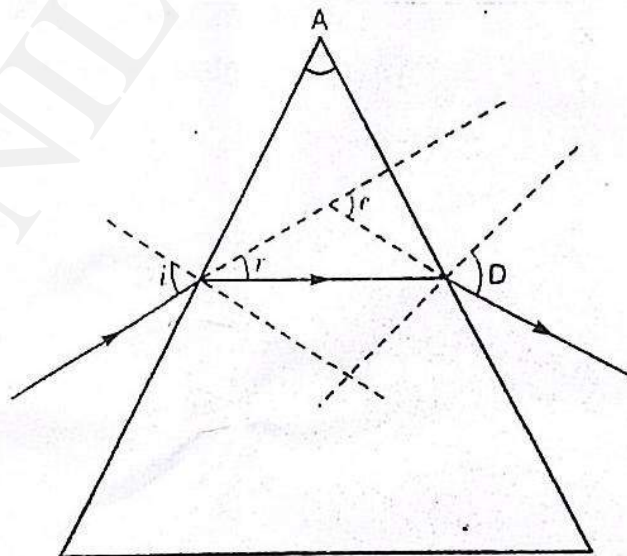
a)   ∠A and ∠i   b)   ∠A, ∠i and ∠r

c)   ∠A, ∠i, ∠e and ∠D   d)   ∠A, ∠i, ∠r and ∠D

34. What do you observe when you add a few drops of acetic acid to a test tube containing:

     i)   phenolphthalein   ii)   distilled water

     iii)   blue litmus paper   iv)   sodium hydrogen carbonate powder

35. Draw a labelled diagram to show that particular stage of binary fission in Amoeba in which its nucleus elongates and divide into two and a constriction appears in its cell membrane.

36. A student focusses the image of a well illuminated distant object on a screen using a convex lens. After that he gradually moves the object towards the lens and each time focuses its image on the screen by adjusting the lens.

     i)   In which direction-towards screen or away from the screen, does he move the lens.

     ii)   What happens to the size of the image ? Does it decrease or increase ?

     iii)   What happens to the image on the screen when he moves the object very close to the lens ?