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PLEASE OPEN THE BOOKLET ONLY WHEN DIRECTED BY THE INVIGILATOR.

ಪರೀಕ್ಷಾ ಮೇಲ್ವಿಚಾರಕರು ನಿರ್ದೇಶನ ನೀಡಿದ ನಂತರವೇ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಪುಸ್ತಕವನ್ನು ತೆರೆಯತಕ್ಕದ್ದು.

Total Number of Questions/ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳು	: 190
Number of Questions to be answered/ಉತ್ತರಿಸಬೇಕಾದ ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ	: 100
Maximum Marks/ಗರಿಷ್ಠ ಅಂಕಗಳು	: 100
Maximum Time/ಗರಿಷ್ಠ ಸಮಯ	: 3 Hours

100921

QUESTION PAPER BOOKLET SERIAL NO.

CANDIDATES HAVE TO WRITE THE OMR SERIAL NUMBER IN THIS BOX ಅಭ್ಯರ್ಥಿಗಳು ಓ.ಎಂ.ಆರ್. ಕ್ರಮಾಂಕವನ್ನು ಈ ಅಂಕಣದಲ್ಲಿ ಬರೆಯತಕ್ಕದ್ದು	CANDIDATES HAVE TO WRITE THEIR REGISTER NO. IN THIS BOX ಅಭ್ಯರ್ಥಿಗಳು ತಮ್ಮ ರಿಜಿಸ್ಟರ್ ನಂಬರ್‌ನ್ನು ಈ ಅಂಕಣದಲ್ಲಿ ಬರೆಯತಕ್ಕದ್ದು	QUESTION PAPER VERSION CODE ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಶ್ರೇಣಿವರ್ಷನ್ ಕೋಡ್ A
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IMPORTANT INSTRUCTIONS

THIS PAPER HAS 190 QUESTIONS. THE 30 QUESTIONS OF PART A AND 25 QUESTIONS OF PART C ARE COMPULSORY. BESIDES PART A AND PART C, CANDIDATES SHOULD ATTEMPT ONLY EITHER SECTION A OR SECTION B OR SECTION C OF PART B.

Do not carry Mobile phones and Calculators during the time of test. You will lose your candidature if you do so.

1. Only Blue or Black colour ball point pen should be used for marking answers and writing OMR Sheet.
2. All the questions carry equal marks.
3. Before opening the booklet, take out the OMR sheet kept inside the question paper carefully and write your name, registration number, Question paper version code, sign at the appropriate place on the OMR sheet and get the invigilator's signature in the place provided in the OMR.
4. Each question is followed by five answers, of which only one is complete and most correct. Please mark the answer which you feel is most correct and complete by fully darkening the oval of that answer in the OMR sheet.
5. There is no negative marking. However if more than one response is marked for a question, the answer shall be evaluated as wrong option marked and the candidate shall be awarded zero marks for that question. Therefore, mark only one answer.
6. In case the response marked by you on the OMR sheet matches the "Key of right answers" as provided by panel of experts, you will be awarded full marks for that question.
7. Do not fold, tear or smudge the OMR sheet. Do not leave any stray marks on the OMR sheet.
8. Blank space on back page of the question paper may be used for rough work.
9. Questions are provided in Kannada and English. However in case of lack of clarity in Kannada version, English version may be referred to as correct.
10. So go ahead. Best of luck.

ಬಹುಮುಖ್ಯ ಸೂಚನೆಗಳು

ಈ ಪತ್ರಿಕೆಯು 190 ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿದೆ. 'ಭಾಗ - ಎ' ಯ 30 ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಭಾಗ - ಸಿ ಯ 25 ಪ್ರಶ್ನೆಗಳು ಕಡ್ಡಾಯ. ಭಾಗ - ಎ ಮತ್ತು ಭಾಗ - ಸಿ ಯೊಂದಿಗೆ ಅಭ್ಯರ್ಥಿಗಳು ಭಾಗ - ಬಿ ಯ ವಿಭಾಗ - ಎ ಅಥವಾ ವಿಭಾಗ - ಬಿ ಅಥವಾ ವಿಭಾಗ - ಸಿ ಯಲ್ಲಿ ಯಾವುದಾದರೊಂದು ವಿಭಾಗವನ್ನು ಮಾತ್ರ ಉತ್ತರಿಸತಕ್ಕದ್ದು.

ಪರೀಕ್ಷೆಯ ಸಮಯದಲ್ಲಿ ಮೊಬೈಲ್ ಫೋನ್ ಮತ್ತು ಕ್ಯಾಲ್ಕುಲೇಟರ್‌ಗಳನ್ನು ತರಬಾರದು. ನೀವು ಇವುಗಳನ್ನು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯೊಳಗೆ ತಂದಲ್ಲಿ ನಿಮ್ಮ ಅಭ್ಯರ್ಥಿತನವನ್ನು ನೀವು ಕಳೆದುಕೊಳ್ಳುತ್ತೀರಿ.

1. ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿ ಬರೆಯಲು ಮತ್ತು ಉತ್ತರಗಳನ್ನು ಗುರುತಿಸಲು ಕಡ್ಡಾಯವಾಗಿ ನೀಲಿ ಅಥವಾ ಕಪ್ಪು ಬಣ್ಣದ ಬಾಲ್ ಪೆನ್‌ನ್ನು ಉಪಯೋಗಿಸಿ.
2. ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳು ಸಮಾನ ಅಂಕಗಳನ್ನು ಹೊಂದಿರುತ್ತವೆ.
3. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ತೆರೆಯುವ ಮೊದಲು ಅದರ ಜೊತೆಯಲ್ಲಿರುವ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯನ್ನು ಸುರಕ್ಷಿತವಾಗಿ ಹೊರಗೆ ತೆಗೆಯುವುದು. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ನಿಗದಿತ ಸ್ಥಳದಲ್ಲಿ ನಿಮ್ಮ ಹೆಸರು, ನೋಂದಣಿ ಸಂಖ್ಯೆ ಮತ್ತು ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಶ್ರೇಣಿಯನ್ನು ನಿಗದಿಪಡಿಸಿದ ಕಲಂಗಳಲ್ಲಿ ಭರ್ತಿ ಮಾಡುವುದು ಹಾಗೂ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ನಿಗದಿತ ಅಂಕಣದಲ್ಲಿ ಪರಿಶ್ರಮ ಮೇಲ್ವಿಚಾರಕರ ಸಹಿ ಮಾಡುವುದು.
4. ಪ್ರತೀ ಪ್ರಶ್ನೆಗೆ ಐದು ಉತ್ತರಗಳನ್ನು ಕೊಡಲಾಗಿದೆ. ಇವುಗಳಲ್ಲಿ ಒಂದು ಮಾತ್ರ ಪರಿಪೂರ್ಣ ಮತ್ತು ಸರಿಯಾದುದು. ಯಾವ ಉತ್ತರ ಪರಿಪೂರ್ಣ ಮತ್ತು ಸರಿ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರೋ ಅದನ್ನು ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿನ ಉತ್ತರದ ವೃತ್ತವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ಗುರುತು ಮಾಡುವ ಮೂಲಕ ದಾಖಲಿಸಿ.
5. ನಕಾರಾತ್ಮಕ ಅಂಕಗಳಿರುವುದಿಲ್ಲ. ಆದರೆ, ನೀವು ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚು ಉತ್ತರವನ್ನು ಒಂದು ಪ್ರಶ್ನೆಗೆ ನೀಡಿದರೆ, ಇವುಗಳನ್ನು ಮೌಲ್ಯಮಾಪನ ಮಾಡುವಾಗ ತಪ್ಪು ಆಯ್ಕೆ ಎಂದು ಪರಿಗಣಿಸಿ, ಆ ಪ್ರಶ್ನೆಗೆ ಶೂನ್ಯ ಅಂಕವನ್ನು ನೀಡಲಾಗುವುದು. ಆದ್ದರಿಂದ, ಒಂದೇ ಉತ್ತರವನ್ನು ಗುರುತಿಸಿ.
6. ಒಂದೊಮ್ಮೆ ನೀವು ಗುರುತಿಸಿದ ಉತ್ತರವು ತಪ್ಪು ಸಮಿತಿಯು ನಿರ್ಧರಿಸಿದ ಸರಿಯಾದ ಉತ್ತರಕ್ಕೆ ಹೊಂದಿಕೆಯಾಗುವುದಾದರೆ ಪೂರ್ಣ ಅಂಕಗಳನ್ನು ನಿಮಗೆ ನೀಡಲಾಗುವುದು.
7. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯನ್ನು ಮಡಚುವುದಾಗಲಿ, ಹರಿಯುವುದಾಗಲಿ, ಕೊಳೆ ಮಾಡುವುದಾಗಲಿ ಮಾಡಬಾರದು. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಅಸಭ್ಯ ರೀತಿಯ ಗುರುತು ಮಾಡಬಾರದು.
8. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಹಿಂದಿನ ಪುಟದ ಖಾಲಿ ಜಾಗವನ್ನು ನಿಮ್ಮ ಕರೆದು ಕೆಲಸಕ್ಕೆ ಉಪಯೋಗಿಸಬಹುದು.
9. ಪ್ರಶ್ನೆಗಳನ್ನು ಕನ್ನಡ ಮತ್ತು ಆಂಗ್ಲ ಭಾಷೆಗಳಲ್ಲಿ ನೀಡಲಾಗಿದೆ. ಆದರೆ ಇವೆರಡರ ಮಧ್ಯೆಯಾವುದೇ ಅಸ್ಪಷ್ಟತೆ ಕಂಡುಬಂದಲ್ಲಿ, ಆಂಗ್ಲ ಭಾಷೆಯ ಪ್ರಶ್ನೆಯನ್ನು ಸರಿಯಾದ ಪ್ರಶ್ನೆಯೆಂದು ಪರಿಗಣಿಸಿ.
10. ಮುಂದುವರೆಯಿರಿ. ನಿಮಗೆ ಶುಭವಾಗಲಿ.

[P.T.O.]

SEAL

PART - A

(This Part has 30 questions. These are to be attempted by Forestry as well as Non-Forestry Candidates.)

1. What will come in place of the question-mark (?) in the alphabet series EJOT, DHLP, CFIL ?
 (A) BDFH (B) BHLM (C) DEIJ (D) DGKL (E) EHFJ
2. How many pairs of letters are there in the word "TRIANGLE" which have as many letters between them in the word as the alphabet ?
 (A) One (B) Two (C) Three (D) Four (E) Five
3. If the first and second digits in the sequence 5 9 8 1 3 2 7 4 3 8 are interchanged, also the third and fourth digit, the fifth and sixth digits and so on, which digit would be the seventh counting from left ?
 (A) 2 (B) 3 (C) 4 (D) 7 (E) 8
4. Nagraj left for his office in his car. He drove 15 km towards North and then 10 km towards West. He then turned to the South and covered 15 km. Further, he turned to the East and moved 8 km. Finally, he turned right and drove 10 km. How far and in which direction is he from his starting point ?
 (A) 2 Kms West (B) 2 Kms East (C) 2 Kms North
 (D) 3 Kms South (E) 3 Kms North
5. Two vessels A and B contain milk and water in the ratio 7:1 and 9:7 respectively. What is the ratio in which the mixtures must be taken from the two vessels the resultant mixture in the ratio 2:1 ?
 (A) 1:1 (B) 2:1 (C) 1:2 (D) 2:3 (E) 3:2
6. What will be the total surface area of a hemisphere of radius of 7 cm ? (Take $\pi = 22/7$)
 (A) 154 square cms. (B) 308 square cms. (C) 462 square cms.
 (D) 616 square cms. (E) 770 square cms.
7. 25% of 75% of 80 = ?
 (A) 15 (B) 30 (C) 45 (D) 60 (E) 75

A

(2)



8. In each of the following, the measures of the three angles are given. In which case the angles can be those of a triangle ?

- (A) $59^\circ, 72^\circ, 61^\circ$ (B) $45^\circ, 61^\circ, 73^\circ$ (C) $30^\circ, 125^\circ, 20^\circ$
 (D) $33^\circ, 37^\circ, 90^\circ$ (E) $63^\circ, 37^\circ, 80^\circ$

In the questions 9 and 10 are given some Statements followed by some Conclusions. You have to take the given Statements to be true even if they seem to be at variance with commonly known facts. Read all the Conclusions and then decide which of the given Conclusions logically follows from the given Statements, disregarding commonly known facts.

9. Statements :

All flowers are clouds.

No cloud is sky.

All skies are tigers.

Conclusions :

I. Some clouds are flowers.

II. All clouds are flowers.

III. Some tigers are skies.

IV. All tigers are skies.

- (A) Only conclusions II and IV follow
 (B) Only either conclusion I or conclusion II follows
 (C) Only either conclusion III or conclusion IV follows
 (D) All the conclusions I, II, III and IV follow
 (E) None of the conclusions I, II, III and IV follow

10. Statements :

Some boys are rains.

All rains are clouds.

Some clouds are cars.

Conclusions :

I. Some clouds are boys.

II. Some cars are boys.

III. Some cars are rains.

IV. Some rains are boys.

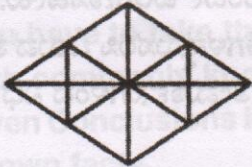
- (A) If none of the conclusions I, II, III and IV follow
 (B) If only conclusion II follows
 (C) If only conclusion IV follows
 (D) If only conclusions I and IV follow
 (E) If all the conclusions I, II, III and IV follow



11. Which number continues the numeric series 7, 14, 7, 22, 7, 30, 7, 38, 7, ?
 (A) 7 (B) 46 (C) 56 (D) 66 (E) 76

12. Which of the following options continues the series $ZA_5, Y_4B, XC_3, W_2D, \dots$?
 (A) VE_1 (B) V_1E (C) E_1V (D) EV_1 (E) VE

13. How many triangles are in the following figure ?



(A) 16 (B) 20 (C) 24 (D) 28 (E) 32

14. If $x - \frac{1}{x^2} = 5$, what is the value of $x^2 + \frac{1}{x^2}$?

(A) 25 (B) 27 (C) 30 (D) 32 (E) 33

15. At a point P on the ground, the angle of elevation of the top of a 10 mts. tall building and of a helicopter hovering some distance over the top of the building are 30° and 60° respectively. The height of the helicopter above ground is

(A) $\frac{10}{\sqrt{3}}$ mts. (B) $10\sqrt{3}$ mts. (C) $\frac{20}{\sqrt{3}}$ mts.
 (D) $20\sqrt{3}$ mts. (E) 30 mts.

16. What is the value of the expression given below ?

$$\frac{23 \times 23 + 17 \times 17 + 2 \times 23 \times 17}{23 \times 23 - 17 \times 17}$$

(A) $10/3$ (B) $20/3$ (C) $17/23$ (D) $23/17$ (E) $27/23$

17. Aman is walking at a speed of 10 km/h. After every km, he takes rest for 4 minutes. How much time will he take to cover a distance of 10 km ?

(A) 1 hour (B) 1 hour 32 minutes (C) 1 hour 36 minutes
 (D) 1 hour 40 minutes (E) 1 hour 44 minutes

18. If difference between simple interest on a certain sum at 4% for 6 years and at 5% for 4 years is Rs. 28, find the sum.

(A) Rs. 200 (B) Rs. 300 (C) Rs. 400 (D) Rs. 600 (E) Rs. 700

19. A and B can do a piece of work in 15 and 18 days respectively. A worked at it for 10 days and then B finished the remaining work. Find the time taken by B to finish the remaining work.
- (A) 2 days (B) 3 days (C) 4 days (D) 5 days (E) 6 days
20. A, B, C, D, E, F, G and H are sitting around a circular table facing the centre. H is third to the right of C and second to the left of E. B is not an immediate neighbour of H or C. F is second to the right of D and is an immediate neighbour of C. G is not the neighbour of E. Who is sitting opposite to D?
- (A) B (B) C (C) F (D) G (E) H
21. A data set contains six numbers a, b, c, d, e and f occurring in decreasing order. What is the median of the data ?
- (A) c
(B) d
(C) Arithmetic mean of 'c' and 'd'
(D) Geometric mean of 'c' and 'd'
(E) Harmonic mean of 'c' and 'd'
22. The arithmetic mean of a data is "M" and standard deviation "S". If each of the value of the data is first doubled and then 2 added, what will be the new arithmetic mean and standard deviation ?
- (A) M and 2S respectively
(B) M and (2S + 2) respectively
(C) 2M and (2S + 2) respectively
(D) (2M + 2) and (2S + 2) respectively
(E) (2M + 2) and S respectively
23. The mean of five numbers is 30. If one number is excluded, their mean becomes 28. What is the excluded number?
- (A) 30 (B) 34 (C) 38 (D) 42 (E) 46
24. The Geometric Mean of three numbers; 'm', 64 and 'n', was calculated to be 16. It was realized that there was a mistake in the data. The number 64 was wrong. In its place 27 was the correct figure.
- The correct Geometric Mean will be
- (A) 3 (B) 4 (C) 8 (D) 12 (E) 15



25. What will be the mean deviation of the data 7, 9, 4, 10 and 15?
 (A) 0 (B) 2.0 (C) 2.8 (D) 3.6 (E) 4.2
26. Three brothers live in a flat in Chennai. Ravi leaves home at 8.00 AM and returns at 6.00 PM. Kumar leaves home at 10.00 AM and returns home at 11.00 PM and Gautham leaves by 7.00 PM and returns at 6.00 AM. During which of the following time-periods all brothers are together at home?
 (A) 6.00 PM to 7.00 PM
 (B) 6.00 AM to 7.00 AM
 (C) 6.00 AM to 8.00 AM
 (D) 6.00 PM to 8.00 PM
 (E) 6.00 AM to 7.00 PM
27. If 'A + B' means 'A is daughter of B', 'A - B' means 'A is father of B', 'A + B' means 'B is sister of A' and 'A x B' means 'A is grandfather of B' which of the following means 'L is niece of M' ?
 (A) $M + P - N$ (B) $M + P - N + L$ (C) $L + N - P + M$
 (D) $N + L + P + M$ (E) $L + N + M + P$
28. Each of the six friends P, Q, R, S, T and U has a different weight. R is heavier than T but lighter than U. Q is lighter than only P. T is not the lightest. T weighs 50 kgs. The one who is the third heaviest weighs 63 Kgs. Whose weight could possibly be 49 Kgs ?
 (A) S (B) P (C) Q (D) R (E) U
29. If Statements: $H < B$, $H \geq D > E$ and $G \geq F > B$ are true, what is of the following is correct about conclusions: I. $E \geq B$ and II. $F \geq H$?
 (A) Either conclusion I or II is only correct
 (B) Neither conclusion I nor II is correct
 (C) Only conclusion I is correct
 (D) Only conclusion II is correct
 (E) Both the conclusions I and II are correct
30. In an apartment Anita, Bina, Chetana, Dipika and Ekta live on different floors of 5 storey building such that ground floor is numbered 1 and top floor is numbered 5. Anita lives on the floor only below Ekta's and Chetana's floor. Bina lives on the floor immediate above Dipika's floor. Who among them lives on the 2nd floor ?
 (A) Anita (B) Bina (C) Chetana (D) Dipika (E) Ekta

PART - B

SECTION - A

(This Part has 45 questions. These are to be attempted by Forestry Candidates Only.)

31. Which among the following National Park is distinct in India because it encompasses a Project Tiger Reserve, an Elephant Reserve and a Biosphere Reserve (all of them) ?
- (A) Manas Tiger Reserve
(B) Kanha Tiger Reserve
(C) Panna Tiger Reserve
(D) Simlipal Tiger Reserve
(E) Kali Tiger Reserve
32. The Washington Convention whose formal name is abbreviated as CITES is related to which among the following ?
- (A) Pesticides
(B) Ozone Depletion
(C) Endangered Species
(D) Human Rights
(E) Climate Change
33. The Siberian Crane, an endangered migratory bird, is a regular visitor of which of the following National Park/Bird Sanctuaries ?
- (A) Ranganathittu Bird Sanctuary
(B) Keoladeo National Park
(C) Vedanthangal Bird Sanctuary
(D) Sultanpur Bird Sanctuary
(E) Kumarakom Bird Sanctuary
34. One Diopetre is approximately equivalent to
- (A) Sine 0.57
(B) 1/100
(C) 34.36 minutes
(D) Both A and C
(E) All that is A, B and C



39. The names of endangered plant species are published in
 (A) Green Data Book
 (B) Red Data Book
 (C) Endangered Species Book
 (D) Yellow Data Book
 (E) None of the above
40. Where was the first biosphere reserve established in India ?
 (A) Nanda Devi (B) Nilgiri (C) Sunderbans
 (D) Gulf of Munnar (E) None of the above
41. Leukemia can be cured through
 (A) Periwinkle plant
 (B) Pyrethrum
 (C) Chrysanthemum
 (D) Bersera
 (E) Honey
42. Which one of the following States does not have the Tropical deciduous forests ?
 (A) Jharkhand (B) Western Orissa (C) Chhattisgarh
 (D) Rajasthan (E) Karnataka
43. Dietrich Brandis was the
 (A) First governor of forest management
 (B) Founder of Forest Society
 (C) First Inspector General of forests in India
 (D) Governor to introduce Forest Act of 1858
 (E) Started Indian Forest Service
44. The root system of trees in coniferous forests is
 (A) buttress root system (B) dormant root system (C) shallow root system
 (D) deep root system (E) fibrous root system
45. Which of the following State has got largest forest area in the country ?
 (A) Madhya Pradesh (B) Arunachal Pradesh (C) Chhattisgarh
 (D) Maharashtra (E) Karnataka



46. How much area (in sq. km) is under the forest cover in our country (India) ?
(A) 758330 (B) 768436 (C) 750093 (D) 749832 (E) 708273
47. Which of the following is not the characteristics of Steppes and Savannas?
(A) Tree less plains of grasses
(B) Low water table
(C) Abundance of monocots
(D) Common in North America, China, USSR and Canada
(E) Grass covered plains in tropical zone
48. Pyramid of numbers in a grassland/tree ecosystem is
(A) Always inverted
(B) Always upright
(C) Both A and B
(D) Spindle-shaped
(E) None of the above
49. Which of the following Environmentalists first gave the concept of Biodiversity 'hotspots'?
(A) Gaylord Nelson
(B) Norman Myers
(C) John Muir
(D) Julia "Butterfly" Hill
(E) Lester Brown
50. In Tropical Evergreen Forests, presence of following species is considered as an indicator for good growth and regeneration of Dipterocarps.
(A) *Mesua ferrea*
(B) *Vatica lanceofolia*
(C) *Mallotus philippensis*
(D) *Leea sambucina*
(E) *Glycosmis spp.*

51. In a sample plot of 0.25 Ha, while viewing from a Wedge Prism with BAF 2, if the following results were obtained.

Trees with overlapping images 9

Trees with margins just touching 15

The basal area of the sample plot is

(A) 5.75 (B) 6.25 (C) 7.75 (D) 8.25 (E) 9.75

52. Which of the following is not correct with reference to Scheduled Animals ?

(A) Animals listed in Schedule I and Part II of Schedule II

(B) Tigers, Elephants, Gaur, Black Buck, Pea Fowl

(C) Different punishment in protected areas and private areas

(D) Scheduled animals include Beetles, Otters, Civets, Weasels

(E) All the above

53. As per the Wildlife Protection Act, 1972, animal does not include

(A) Eggs

(B) Invertebrates

(C) Young ones

(D) Nests

(E) Chordates

54. Match the following Wildlife Sanctuaries with their flagship species :

i. Chincholi Wildlife Sanctuary

a. Chinkara

ii. Gudekote Wildlife Sanctuary

b. Nilgiri Marten

iii. Yedahalli Wildlife Sanctuary

c. Grey Wolf

iv. Rangayyanadurga Wildlife Sanctuary

d. Sloth Bear

v. Talacauvery Wildlife Sanctuary

e. Four Horned Antelope

(A) i(b), ii(c), iii(e), iv(a), v(d)

(B) i(a), ii(c), iii(d), iv(b), v(e)

(C) i(c), ii(d), iii(a), iv(e), v(b)

(D) i(b), ii(c), iii(a), iv(e), v(d)

(E) i(c), ii(d), iii(e), iv(a), v(b)

55. The concept of Biosphere Reserve was evolved by
 (A) Botanical Survey of India
 (B) UNDP
 (C) UNEP
 (D) MOFE and CC
 (E) UNESCO
56. Burning of fossil fuels add
 (A) CO_2 , SO_2 , NO_2 gases in air
 (B) Carbon, SO_2 , Nitrogen gases in air
 (C) Carbon Monoxide, SO_3 , Ozone, gases in air
 (D) Methane, CO_2 , NO_2 gases in air
 (E) Ozone, Methane, CO_2 gases in air
57. Oxygen liberated during photosynthesis is coming from
 (A) Atmosphere
 (B) Carbon Dioxide
 (C) Water
 (D) Breakdown of chlorophyll
 (E) Ozone
58. The substance that does not biomagnify is
 (A) Dichlorodiphenyl trichloroethane
 (B) Monomethyl mercury
 (C) Chloroflorocarbons
 (D) Hexachlorobenzene
 (E) Toxaphene
59. United Nations Conference on the Environment and Development was held in Rio de Janeiro in
 (A) 1992 (B) 1995 (C) 1997 (D) 2004 (E) 2011
60. The height class (mts) of Teak (*Tectona grandis*) in site quality II is
 (A) 40.3 to 36.6 (B) 36.6 to 30.5 (C) 30.5 to 24.4
 (D) 24.4 to 13.3 (E) 18.3 to 12.2

61. Which of the following species is not found in Southern Montane Wet Temperate Forests ?
- (A) *Machilus edulis*
 (B) *Rhododendron spp.*
 (C) *Eugenia arnottiana*
 (D) *Symplocos spp.*
 (E) *Michaelia nilagirica*
62. Crops which are raised with primary object of helping up a less hardy species and are usually removed at an early stage as soon as they served this purpose
- (A) Cover crops (B) Nurse crops (C) Inter crops
 (D) Mixed crops (E) Alley crops
63. Match the List – I with List – II and choose the correct answer from the given codes.

List – I (Event)

- a. Earth Day
 b. World Environment Day
 c. Ozone Day
 d. World Biodiversity Day
 e. World Water Day

List – II (Date)

- i. 5th June
 ii. 22nd May
 iii. 22nd April
 iv. 22nd March
 v. 16th September

Codes:

- | | a | b | c | d | e |
|-----|-----|-----|----|-----|-----|
| (A) | i | ii | iv | v | iii |
| (B) | iii | i | v | ii | iv |
| (C) | ii | i | iv | v | iii |
| (D) | v | iii | ii | i | iv |
| (E) | iv | v | i | iii | ii |

64. Which is not a part of National Action Plan on Climate Change ?

- (A) National Water Mission
 (B) National Mission on Pollution Control
 (C) National Solar Mission
 (D) National Mission on Sustainable Habitat
 (E) National Mission for Sustainable Agriculture

65. Cytokinin, a naturally occurring materials having hormonal properties, helps in
- Stem elongation
 - Bud initiation
 - Development of latent roots
 - Root formation
 - Leaf elongation
66. Which of the following fungi causes Pink disease ?
- Colletotrichum gleosporides*
 - Gleosporium spp.*
 - Ganoderma lucidum*
 - Fusarium spp.*
 - Corticium salmonicolor*
67. Frankincense, a gum oleoresin is obtained from which of the following species ?
- Boswellia serrata*
 - Commiphora mukul*
 - Canarium strictum*
 - Anogeissus latifolia*
 - Balanocarpus spp.*
68. Which of the following is not an ingredient of Dasamoola ayurvedic medicine ?
- Aegle marmelos*
 - Stereospermum suaveolens*
 - Umelia arborea*
 - Saraca asoca*
 - Premna mucronate*
69. The word 'ecosystem' was coined by
- Daubenmire
 - Weaver and Clements
 - Tansley
 - Odum
 - Kormondy



70. Free living Nitrogen fixing anaerobic bacteria
 (A) *Azotobacter* (B) *Clostridium* (C) *Rhizobium*
 (D) *Anabaena* (E) BGA
71. Single stem silviculture is also referred as
 (A) Advance thinning
 (B) Crown thinning
 (C) Numerical thinning
 (D) Free thinning
 (E) Selection felling
72. In which of the following tree species, Ripple Marks are not seen ?
 (A) *Dalbergia spp.*
 (B) *Pterocarpus spp.*
 (C) *Bombax insignae*
 (D) *Dipterocarpus spp.*
 (E) All the above
73. Depending on the treatment, improved woods may be classified as
 (A) Impregnated wood
 (B) Heat stabilized wood
 (C) Hard wood
 (D) Compressed wood
 (E) Chemically modified wood
74. Which of the following is good as a raw material for news print ?
 (A) Bagasse
 (B) Salai (*Boswellia serrata*)
 (C) Sabai grass (*Eulaliopsis binata*)
 (D) *Eucalyptus pallida*
 (E) *Pinus roxburghii*
75. What per cent of the full circular method, the quarter girth formula gives the tree volume ?
 (A) 63.6 (B) 36.4 (C) 100 (D) 78.5 (E) 21.5



SECTION – B

(This Part has 45 questions. These are to be attempted by Pure Science Candidates Only.)

31. Which of the following functions numbered I, II and III can represent the radial wave function/s for an electron in an atom ? ('r' is the distance of the electron from the nucleus; 'A' and 'b' are constants)
- I. Ae^{-br}
II. $A \sin(b/r)$
III. A/r
- (A) Only I (B) Only II (C) I and II only
(D) II and III only (E) I and III only
32. An ether is more volatile than an alcohol having the same molecular formula This is due to
- (A) dipolar character of ethers
(B) alcohols having resonance structures
(C) inter-molecular hydrogen bonding in ethers
(D) inter-molecular hydrogen bonding in alcohols
(E) none of the above
33. Which one of the following acids is a vitamin ?
- (A) Aspartic acid
(B) Adipic acid
(C) Ascorbic acid
(D) Saccharic acid
(E) Maleic acid
34. The IUPAC name of the coordination compound $K_3[Fe(CN)_6]$ is
- (A) Potassium hexacyanoferrate (III)
(B) Potassium hexacyanoferrate (II)
(C) Potassium hexacyanoiron (II)
(D) Tripotassium hexacyanoiron (II)
(E) Potassium ferric cyanide



35. Water is a resource that is
- Nondegradable nonmaintainable
 - Degradable maintainable
 - Renewable
 - Non-renewable
 - Non- maintainable
36. Major aerosol pollutant in jet plane emission is
- Sulphur dioxide
 - Carbon monoxide
 - Carbon dioxide
 - Fluorocarbon
 - Methane
37. Acid rains are produced by
- Excess NO_2 and SO_2 from burning fossil fuels
 - Excess production of NH_3 by industry and coal gas
 - Excess release of carbon monoxide by incomplete combustion
 - Excess formation of CO_2 by combustion and animal respiration
 - Excess release of methane in the atmosphere
38. Entropy of the universe is
- continuously increasing
 - continuously decreasing
 - zero
 - constant
 - periodically increasing and decreasing
39. Which one of the following does not involve coagulation ?
- Formation of delta regions
 - Clotting of blood by the use of ferric chloride
 - Peptization
 - Treatment of drinking water by potash alum
 - None of these

40. The velocity of sound in air in a room is 340 mtrs/sec. An organ pipe of 29 cms. length has both ends open. An extra hole is created at half its length. What will be the lowest frequency of sound that can be produced by it ?
- (A) 293 hertz. (B) 586 hertz. (C) 1172 hertz.
(D) 2344 hertz. (E) 4688 hertz.
41. A net force F_A acts on object A and a net force F_B acts on object B. The mass of object B is twice the mass of object A and the acceleration of object B is twice that of object A. Which of the following is true of forces F_A and F_B ?
- (A) $F_B = 1/2 F_A$ (B) $F_B = F_A$ (C) $F_B = 2 F_A$
(D) $F_B = 4 F_A$ (E) $F_B = 8 F_A$
42. A perfect black body having temperature T radiates energy at the rate of 10 watts. If the temperature of the body had been $2T$, what would have been the rate of radiation of energy ?
- (A) 20 watts (B) 40 watts (C) 80 watts
(D) 160 watts (E) 320 watts
43. A particle of mass '2m' moving with a velocity of 'u' meters per second in the positive X direction collides with a stationary particle of mass 'm', sticks to it, and the combined mass keeps moving in the same direction. What fraction of initial kinetic energy is lost in the collision ?
- (A) 0 (B) 1/4 (C) 1/3 (D) 2/3 (E) 3/4
44. Cyanide process is used for extraction of
- (A) Ni (B) Pt (C) Zn (D) Mg (E) Ag
45. Which of the Vitamins given below is water soluble
- (A) Vitamin K (B) Vitamin C (C) Vitamin D
(D) Vitamin E (E) Vitamin A



46. The amplitude of a lightly damped oscillator decreases by 10.0% during each cycle. What percentage of the mechanical energy of the oscillator is lost in each cycle ?
- (A) 1% (B) 10% (C) 12%
(D) 15% (E) 19%
47. A plane in a cubic lattice makes intercepts of r , $r/2$ and $2r/3$ with the three crystallographic axes. What will be the Miller indices for this plane ?
- (A) (2 3 4) (B) (2 4 3) (C) (4 2 3)
(D) (4 3 2) (E) (3 4 2)
48. A Carnot engine absorbs heat at a temperature of 727 degree celsius and exhausts at a temperature of 527 degree celsius. If 2000 Joules of energy is absorbed by it, what is the amount of work that will be done by the engine ?
- (A) 400 Joules
(B) 500 Joules
(C) 600 Joules
(D) 700 Joules
(E) 800 Joules
49. A particle is in an infinite square well potential with walls at $x = 0$ and $x = L$. If the particle is in the state $\psi(x) = A \sin(3\pi x/L)$, where 'A' is a constant, what is the probability that the particle lies between $x = L/3$ and $x = 2L/3$?
- (A) $1/\sqrt{3}$ (B) $1/3$ (C) $2/\sqrt{3}$
(D) $2/3$ (E) $2/3\sqrt{3}$
50. An electron of rest mass 'm' has a total energy that is equal to four times its rest energy. If the velocity of light is 'c', what is the momentum of the electron ?
(All units are in MKS system)
- (A) mc (B) $2mc$ (C) $\sqrt{15}mc$
(D) $2\sqrt{15}mc$ (E) $3\sqrt{15}mc$



51. Hydrogen gas is not liberated when the following metal is added to dil. HCl
- (A) Ag
 - (B) Mg
 - (C) Sn
 - (D) Zn
 - (E) All of them result in liberation of hydrogen gas
52. A gas will approach ideal behaviour at
- (A) low temperature, high pressure
 - (B) low temperature, low pressure
 - (C) high temperature, high pressure
 - (D) high temperature, low pressure
 - (E) none of the above
53. Bakelite is a polymer of
- (A) benzaldehyde and phenol
 - (B) formaldehyde and benzyl alcohol
 - (C) acetaldehyde and phenol
 - (D) acetaldehyde and butyl alcohol
 - (E) formaldehyde and phenol
54. Which one of the following sets of ions represents a collection of isoelectronic species ?
- (A) Ba^{2+} , Sr^{2+} , K^+ , S^{2-}
 - (B) K^+ , Cl^- , Ca^{2+} , Sc^{3+}
 - (C) N^{3-} , O^{2-} , F^- , S^{2-}
 - (D) Li^+ , Na^+ , Mg^{2+} , Ca^{2+}
 - (E) K^+ , Cl^- , Zn^{2+} , Mg^{2+}



55. Which of the following has ester linkage ?
 (A) PVC (B) Terylene (C) Nylon
 (D) Bakelite (E) None of these
56. Which of the following polymer is prepared from caprolactam ?
 (A) Nylon 6 (B) Nylon 6,6 (C) Nylon 6, 10
 (D) Nylon 11 (E) None of these
57. The inert gas abundantly found in atmosphere is
 (A) Ar (B) Ne (C) He
 (D) Rn (E) Xe
58. When plants and animals decay, the organic nitrogen is converted into inorganic nitrogen. The inorganic nitrogen is in the form of
 (A) Ammonia (B) Elements of nitrogen (C) Nitrates
 (D) Nitrides (E) Nitrites
59. Calculate the wavelength (in nanometer) associated with a proton moving at $1.0 \times 10^3 \text{ms}^{-1}$
 (Mass of proton = $1.67 \times 10^{-27} \text{ kg}$ and $h = 6.63 \times 10^{-34} \text{ Js}$)
 (A) 0.032 nm (B) 14.0 nm (C) 0.40 nm (D) 2.5 nm (E) 3.2 nm
60. The ability of a given substance to assume two or more crystalline structure is called
 (A) Isomerism (B) Amorphous (C) Polymorphism
 (D) Isomorphism (E) None of the above
61. The coordination number of Al in the crystalline state of AlCl_3 is
 (A) 3 (B) 4 (C) 6 (D) 9 (E) 12
62. Which is used in formation of nylon – 66 ?
 (A) Sulphurous acid (B) Sulphur hexafluoride (C) Phthalic acid
 (D) Adipic acid (E) Butyric acid



63. A proton is accelerated in the $+z$ direction using a potential difference ' V ' for 1 second and then made to enter area where there is a uniform electric field ' E ' in the $+x$ direction and a uniform magnetic field ' B ' in the $+y$ direction. The trajectory of the proton in this area remains unchanged i.e. it continues to move in the $+z$ direction. How would the trajectory be affected if the proton is accelerated using a potential difference ' $2V$ ' ?
- (A) There would have been no change
(B) The proton would be deflected in the $+x$ direction
(C) The proton would be deflected in the $-x$ direction
(D) The proton would be deflected in the $+y$ direction
(E) The proton would be deflected in the $-y$ direction
64. One end of a tungsten wire of length ' $2L$ ' and cross-sectional area ' A ' is connected to one end of another tungsten wire of length ' L ' and cross-sectional area ' $2A$ '. The unsoldered ends are attached to a d.c. battery. If the free end of the shorter wire is at potential of 1 Volt, and the free end of the longer wire at potential of 8 Volts, what will be the potential of the junction ?
- (A) 1.4 Volts (B) 2.4 Volts (C) 3.0 Volts
(D) 3.4 Volts (E) 4.0 Volts
65. In a single slit diffraction experiment, the angle between the first minimum and central maximum is 4×10^{-3} radians. If the wavelength of light used is 4×10^{-7} meters, what is the width of the slit ? (For small angles in radians take $\sin \theta = \theta$)
- (A) 0.1 millimetre (B) 0.2 millimetre (C) 0.3 millimetre
(D) 0.4 millimetre (E) 0.5 millimetre
66. A balloon is to be filled with helium gas density 0.18 kilogram per cubic meter to suspend a mass of 220 kilograms in air. If the balloon is massless and the density of air is 1.28 Kilogram per cubic meter, what is the minimum quantity of helium required ?
- (A) 50 cubic meters
(B) 100 cubic meters
(C) 150 cubic meters
(D) 200 cubic meters
(E) 250 cubic meters



67. Which of the following statement about the zeolites is false ?

- (A) They are used as cation exchangers.
- (B) They have open structure which enables them to take up small molecules.
- (C) Zeolites are aluminosilicates having three-dimensional network.
- (D) Some of the SiO_4^{-4} units are replaced by AlO_4^{-5} and AlO_6^{-9} ion in zeolites.
- (E) All of the above

68. In the E-waste generated by the Mobile Phones, which among the following metal is most abundant ?

- (A) Copper
- (B) Silver
- (C) Palladium
- (D) Gold
- (E) Iron

69. The ranking of countries as the highest per capita emitters of Carbon Dioxide in the world, takes into account their annual CO_2 emissions from :

- 1. Burning of fossil fuels.
- 2. Cement manufacture.
- 3. Land use, such as deforestation.

Select the correct option from the codes given below.

- (A) Only 1
- (B) Only 2
- (C) 1 and 2
- (D) 1 and 3
- (E) 1,2 and 3

70. Consider the following :

- 1. Shale Gas
- 2. Coal bed methane
- 3. Tight Sand stones, and
- 4. Methane Hydrates.

Choose the "Unconventional" source/sources of Natural Gas from the above.

- (A) 1
- (B) 2
- (C) 1 and 2
- (D) 1, 2 and 3
- (E) 1, 2, 3 and 4

A

A



71. Compound which gives acetone on ozonolysis
- (A) $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3$ (B) $\text{C}_6\text{H}_5\text{CH}=\text{CH}_2$ (C) $\text{CH}_3\text{CH}=\text{CH}_2$ (A)
 (D) $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_3)_2$ (E) $\text{C}_6\text{H}_5\cdot\text{CH}=\text{CH}\cdot\text{C}_6\text{H}_5$ (B)
72. Petrol for aviation purpose must contain
- (A) aromatic hydrocarbons (E)
 (B) olefinic hydrocarbons
 (C) straight chain hydrocarbons
 (D) highly branched chain hydrocarbons (D)
 (E) cycloalkanes (E)
73. In a reversible chemical reaction at equilibrium, if the concentration of any one of the reactants is doubled, then the equilibrium constant will
- (A) also be doubled
 (B) be halved
 (C) become one-fourth
 (D) become one-sixth
 (E) remain the same
74. $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3 + \text{heat}$
- What is the effect of the increase of temperature on the equilibrium of the reaction ?
- (A) equilibrium is unaltered
 (B) equilibrium is shifted to the left
 (C) equilibrium is shifted to the right
 (D) reaction rate does not change
 (E) initially shifts to left and then to right
75. In which of the following molecules/ions are all the bonds are not equal ?
- (A) SiF_4 (B) XeF_4 (C) BF_4^-
 (D) SF_4 (E) None of these



SECTION - C

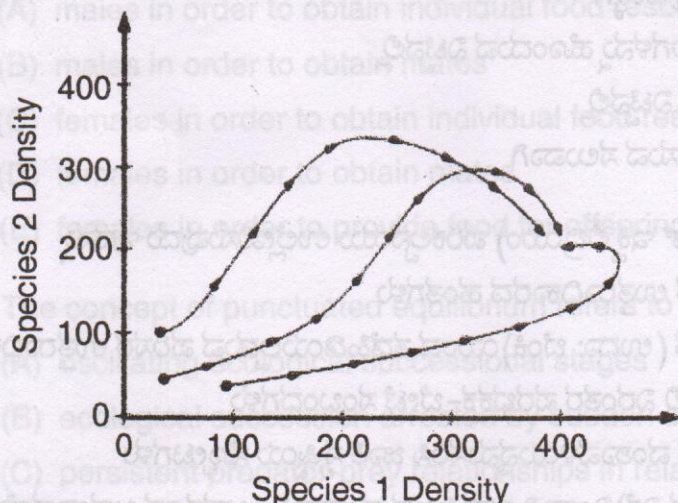
(This Part has 45 questions. These are to be attempted by Life Sciences Candidates Only.)

31. Ferns undergo alternation of generations in which a
- (A) dominant sporophyte alternates with an independent gametophyte
 - (B) dominant gametophyte alternates with a dependent sporophyte
 - (C) sporophyte and a gametophyte have equal life spans
 - (D) gametophyte produces gametes by meiosis
 - (E) gametophyte alternates with a haploid zygote
32. Among primates, a high degree of sexual dimorphism in a species usually indicates intense competition between
- (A) males in order to obtain individual food resources
 - (B) males in order to obtain mates
 - (C) females in order to obtain individual food resources
 - (D) females in order to obtain mates
 - (E) females in order to provide food for offspring
33. The concept of punctuated equilibrium refers to
- (A) oscillating ecological successional stages
 - (B) ecological succession arrested by sudden environmental changes, e.g., fire
 - (C) persistent predator-prey relationships in relatively stable environments
 - (D) bursts of speciation followed by relatively unchanging lineages
 - (E) erratic gene-frequency changes due to genetic drift
34. Stabilization of the unique coiled structure of an alpha helix in a protein is primarily attributed to
- (A) hydrogen bonding between the peptide backbone atoms
 - (B) disulfide bridges between cysteine side chains
 - (C) carbohydrate moieties attached to polar amino acids
 - (D) peptide linkages that covalently bond amino acids
 - (E) an abundance of amino acids with electrically charged side chains

35. Which of the following techniques could be used to demonstrate protein binding to specific DNA sequences ?
- (A) Western blot hybridization
 - (B) Northern blot hybridization
 - (C) Southern blot hybridization
 - (D) Electrophoretic mobility shift assay
 - (E) Polymerase chain reaction

36. Natural enemies have been implicated as a strong selective force for all of the following EXCEPT
- (A) aposematic coloration
 - (B) chemical defenses
 - (C) masting (synchronous fruiting)
 - (D) lekking behavior
 - (E) immune responses

37.



The figure above shows population growth trajectories over time (as indicated by the arrows) of two stored-grain beetle species when grown together under constant conditions. Three experiments were performed that differed only in the initial densities of the two species. Which of the following is the best interpretation of the experimental results ?

- (A) Population growth is random (unpredictable) for each species
- (B) No equilibrium exists in which both species can coexist
- (C) Interspecific competition is stronger than intraspecific competition
- (D) Density dependence within each species is stronger than interspecific competition
- (E) No conclusion can be drawn from the information presented



38. Which of the following is a biological attribute that would most likely allow a species to become cosmopolitan in distribution ?
- (A) Extreme habitat specialization
 - (B) K-selected reproductive rate
 - (C) Limited dispersal abilities
 - (D) Rarity
 - (E) Capacity for long-distance dispersal
39. Consider the following statements.
1. Intrusive rocks are formed while magma thrust to surface cool and solidify within crust.
 2. Plutonic rocks are Extrusive landforms.
 3. Igneous rocks are formed by either plutonic or volcanic activity.
37. Select the correct answer from the following codes.
- (A) Only 2
 - (B) Only 1 and 3
 - (C) Only 2 and 3
 - (D) 3 only
 - (E) 1, 2 and 3
40. Which among the following is key faunal species that is being conserved and monitored in 'Dachigam National Park' ?
- (A) Musk Deer
 - (B) Golden Oriole
 - (C) Yellow-throated Marten
 - (D) Hangul or Kashmir Stag
 - (E) Snow Leopard
41. In which one among the following categories of protected areas in India are local people not allowed to collect and use the biomass ?
- (A) Biosphere Reserves
 - (B) National Parks
 - (C) Wetlands declared under Ramsar convention
 - (D) Wildlife Sanctuaries
 - (E) None of the above

42. The quality and demand for Shahtoosh shawls has led to the endangerment of which of the following species of the antelopes in India ?
- Blackbuck
 - Chiru (Tibetan Antelope)
 - Goa Antelope (Tibetan Gazelle)
 - Goat Antelope
 - Pashmina Goat
43. Proteins destined to be secreted move through the secretory pathway in which of the following orders ?
- Smooth ER → Golgi transport vesicle → Golgi cisternae → Secretory vesicle → Cell surface
 - Rough ER → Golgi transport vesicle → Golgi cisternae → Secretory vesicle → Cell surface
 - Golgi cisternae → ER transport vesicle → Smooth ER → Secretory vesicle → Cell surface
 - Golgi cisternae → ER transport vesicle → Rough ER → Secretory vesicle → Cell surface
 - Rough ER → Smooth ER → Golgi transport vesicle → Golgi cisternae → Secretory vesicle → Cell surface
44. In eukaryotic photosynthetic cells, which of the following occurs when electrons flow cyclically through the electron transport chain associated with photosystem I ?
- Synthesis of ATP
 - Reduction of NADP^+ to NADPH
 - Release of O_2
 - Reduction of CO_2 to sugar
 - Formation of H_2O
45. All of the following may serve as intracellular messengers EXCEPT
- calcium ions
 - cAMP
 - acetylcholine
 - inositol 1, 4, 5-triphosphate
 - 1,2-diacylglycerol



46. Which of the following contain DNA sequences required for the segregation of chromosomes in mitosis and meiosis ?
- (A) Telomeres (B) Centromeres (C) Nucleosomes
(D) Splicesomes (E) Ribosomes
47. Pitti island which is a bird sanctuary and an habitat of oceanic birds is a part of
- (A) Andaman and Nicobar Islands
(B) Lakshadweep Islands
(C) Daman and Diu
(D) Pondicherry
(E) West Bengal
48. With reference to Plate boundaries, which of the following is/are true ?
1. New crust is generated in convergent boundaries.
 2. Convergent boundaries happen only between two continental plates
 3. In divergent boundaries one crust is destroyed by the other.
- Select the correct answer from the following codes.
- (A) Only 1 (B) Only 1 and 2 (C) Only 2 and 3
(D) Only 2 (E) None of the above
49. Which of the following are 'erosional landforms' ?
1. Inselbergs
 2. Loess
 3. Zeugen
 4. Buttes
- (A) 1 and 2 (B) 2 and 3 (C) 1,3 and 4 (D) 1 and 4 (E) all of above
50. The Fluvial Landforms are created by
- (A) Air (B) Water (C) Chemicals
(D) Mechanical forces (E) None of the above
51. Which among the following is the lowest level of a body of water such as an ocean or a lake ?
- (A) Neritic (B) Pelagic
(C) Benthic (D) Demersal
(E) None of the above



52. Which of the following tissues in an actively photosynthesizing plant would have the highest rate of oxygen production ?
- (A) Cortex (B) Palisade mesophyll (C) Epidermis
(D) Vascular cambium (E) Endodermis
53. All of the following statements about plant embryogenesis are correct EXCEPT
- (A) The suspensor is derived from the basal cell.
(B) Cotyledons are derived from the apical cell.
(C) Shoot apical meristem formation occurs after seed formation.
(D) Precursors of all three plant tissue systems are formed during embryogenesis.
(E) Late stages of embryogenesis involve desiccation of embryonic tissues.
54. Which of the following statements about fungi is NOT true ?
- (A) They all are eukaryotic.
(B) They all have rigid cell walls.
(C) Most are filamentous.
(D) Some are photosynthetic.
(E) Many are capable of both sexual and asexual reproduction.
55. All of the following characteristics are typical of r-selected species EXCEPT
- (A) high reproductive rate
(B) small body size
(C) occupancy of unstable environments
(D) minimal parental care
(E) high competitive ability
56. Hardy-Weinberg equilibrium generally assumes all of the following EXCEPT
- (A) a large population (B) genetic drift
(C) random mating (D) absence of selection
(E) absence of migration
57. Which of the following would increase the rate at which a gas diffuses between the alveoli of the lung and the blood within a pulmonary capillary ?
- (A) Decreasing the partial pressure gradient of the gas
(B) Decreasing the rate of blood flow through the pulmonary capillary
(C) Increasing the thickness of the respiratory membrane
(D) Decreasing the solubility of the gas in water
(E) Increasing the total surface area available for diffusion



58. Antibodies that affect bacterial cells interfere with all of the following EXCEPT
 (A) Protein synthesis (B) RNA polymerase (C) Reverse transcriptase
 (D) DNA synthesis (E) Peptidoglycan synthesis
59. Mammals are homeostatic for all of the following EXCEPT
 (A) blood pH (B) blood glucose concentration
 (C) metabolic rate (D) blood calcium concentration
 (E) body temperature
60. Keystone species are thought to have profound effect on the structure and composition of ecological communities because they
 (A) tend to reduce diversity by eliminatory food resource for other species
 (B) provide the foundation for food webs
 (C) are more abundant than most other species in their communities
 (D) have usually narrow niche requirement
 (E) can prevent superior competitors from driving inferior competitors to local extinction
61. Which of the following factor does not promote linkage disequilibrium ?
 (A) Asexual reproduction (B) Coadapted gene complex
 (C) Epistasis (D) Population subdivision (E) Random mating
62. Consider the following :
 1. Carbon dioxide
 2. Oxides of Nitrogen
 3. Oxides of Sulphur.
 Which of the above is/are the emission/emissions from coal combustion at thermal power plants ?
 (A) 1 only (B) 2 and 3 only (C) 1 and 3 only
 (D) 1, 2 and 3 (E) 1 and 2 only
63. Which of the following plant cells undergoes programmed cell death to become functional ?
 (A) Phloem sieve tube member
 (B) Xylem vessel member
 (C) Stomatal guard cell
 (D) Root cap cell
 (E) Bundle sheath cell



64. The ability of the brain to detect differences in stimulus intensity is best explained by the fact that which of the following varies with the stimulus intensity ?
- (A) The amplitude of the action potential
 - (B) The threshold potential
 - (C) The number of action potentials per second
 - (D) The number of synapses crossed
 - (E) The final destination of the action potential
65. When an influenza virus enters a cell, it immediately start to do which of the following ?
- (A) Incorporate viral DNA into the host cells chromosome
 - (B) Destroy the host cells transcriptional machinery
 - (C) Replicate its genetic material and synthesize viral proteins
 - (D) Use a viral copy of reverse transcriptase to manufacture viral DNA
 - (E) Destabilise membrane protein and lyse the host cell
66. All of the following statements about muscle contraction are true EXCEPT
- (A) The ends of actin filaments move closer together
 - (B) The length of myosin filaments does not change
 - (C) Calcium-troponin binding precedes actin-myosin binding
 - (D) Calcium-tropomyosin binding precedes actin-myosin binding
 - (E) ATP hydrolysis precedes actin-myosin binding
67. A prokaryote that is thermophilic and methanogenic and has isoprenylglycerol ethers in its membrane instead of phospholipids is most likely
- (A) a proteobacterium
 - (B) a spirochete
 - (C) a member of the genus *Chlamydia*
 - (D) an archaeon
 - (E) a rickettsia



68. In garden peas, the allele for tall plants (D) is completely dominant to the allele for dwarf plants (d) and the allele for violet flower color (W) is completely dominant to the allele for white flower color (w). In a cross between a tall violet plant, with the genotype DDWw, and a dwarf white plant, what phenotypic ratio of the progeny would be expected from this cross ?
- (A) All tall violet
 (B) 1 tall violet : 1 dwarf violet
 (C) 1 tall violet : 1 tall white : 1 dwarf violet : 1 dwarf white
 (D) 1 tall violet : 1 tall white
 (E) All dwarf white
69. Which of the following statements about mitochondria and chloroplasts is generally true ?
- (A) Plants have chloroplasts but no mitochondria; animals have mitochondria but no chloroplasts.
 (B) Plants have chloroplasts but no mitochondria; fungi have mitochondria but no chloroplasts.
 (C) Plants and fungi have chloroplasts but no mitochondria; animals have only mitochondria.
 (D) Plants and fungi have both chloroplasts and mitochondria; animals have only mitochondria.
 (E) Plants have both chloroplasts and mitochondria; animals and fungi have only mitochondria.
70. In humans, a hereditary disorder called xeroderma pigmentosum (XP) can result in the inability to repair ultraviolet damage to DNA. Which of the following molecular lesions is most likely to accrue in individuals with XP ?
- (A) Thymine dimers
 (B) Deamination of cytosine
 (C) Depurination
 (D) Single strand DNA breaks
 (E) Double strand DNA breaks
71. Double fertilization is a unique feature of flowering plants. In this process, one sperm unites with the egg to yield a zygote. The second sperm unites with the polar nuclei to initiate the formation of the
- (A) megagametophyte (B) endodermis (C) embryo
 (D) endosperm (E) epicotyl



72. Which of the following is the best explanation for why net primary productivity in terrestrial ecosystems tends to increase toward the tropics ?

- (A) The higher species diversity in the tropics tends to increase plant growth
- (B) There are lower metabolic costs to plant growth in the tropics
- (C) The availability of water and warm temperatures in the tropics fosters photosynthesis
- (D) The tropics have more predators that minimize herbivory
- (E) The tropics have a greater availability of newly weathered inorganic nutrients

73. Which of the following statements about excretory organs is true ?

- (A) The kidneys of saltwater fishes produce urine hyperosmotic to their tissues.
- (B) The kidneys of desert mammals produce urine that is hypoosmotic to the urine of freshwater fishes.
- (C) Malpighian tubules allow insects to excrete waste through the exoskeleton.
- (D) Juxtamedullary nephrons in the mammalian kidney allow the organism to produce hyperosmotic urine.
- (E) Metanephridia are excretory organs that allow planaria to filter coelomic fluid.

74. The ranking of countries as the highest per capita emitter of carbon Di Oxide in the world takes into account their annual CO₂ emission from

- 1) Burning of fossil fuels
- 2) Cement manufacture
- 3) Land use such as deforestation

Select the correct option from the codes given below :

- (A) Only 1
- (B) Only 2
- (C) 1 and 2
- (D) 1 and 3
- (E) 1, 2 and 3

75. The crouching of very young birds in response to a predator's shape overhead is an example of

- (A) learned behaviour
- (B) an imprinted behaviour
- (C) a fixed action pattern
- (D) habituation
- (E) a conditioned response



PART - C

(This Part has 25 questions. These are to be attempted by Forestry as well as Non-Forestry Candidates.)

76. The most important type forest in term of economic value and easy exploitation are
- (A) Temperate deciduous forests
 - (B) Coniferous forests
 - (C) Tropical monsoon forests
 - (D) Equatorial forests
 - (E) Shola forest
77. Who appoints the judge of the Supreme Court of India ?
- (A) Prime Minister in consultation with the Chief Justice of India
 - (B) The Chief Justice in consultation with the President of India
 - (C) The President of India in consultation with the Chief Justice
 - (D) The Chief Justice
 - (E) A collegiums of three senior Judges
78. Which of the following statements are true about Directive Principles of State Policy ?
1. The DPSP are in the nature of instruments of instruction to the Government of the day to achieve certain ends.
 2. Prohibition of liquor and intoxicating drugs. Even for medical purposes it should not be used.
 3. To protect and improve the environment and to safeguard forests and wildlife.
 4. To safeguard public property and to abjure violence.
- (A) All of the above (B) None of the above (C) Only 1,2 and 3
- (D) Only 1 and 3 (E) Only 3 and 4
79. 'Dyarchy' of dual Government by way of providing a responsible Government at the level of the Provinces, where subjects of administration were divided between Central Government and State Government was introduced by which Act of the British ?
- (A) The Government of India Act, 1919 also known as Montagu- Chelmsford Reforms
 - (B) The Government of India Act, 1909 also known as Morley-Minto Reforms
 - (C) The Government of India Act, 1935
 - (D) Indian Councils Act, 1892
 - (E) Indian Councils Act, 1861



80. Which of the following industry generates invisible exports ?
- (A) Fishing (B) Travel and Tourism (C) Jewellery
(D) Computer hardware (E) Handicrafts
81. Which one of the following is a capital receipt in a Government Budget ?
- (A) Interest receipts on loans given by the Government to other parties
(B) Dividends and profits from public sector undertakings
(C) Borrowing of the Government from public
(D) Property tax receipts
(E) Income tax receipts
82. In India, the share of agriculture in GDP has declined at a very fast rate in the recent years. This is due to
- (A) Lack of diversification of rural economy
(B) Very slow growth rate of agriculture vis-à-vis other sectors
(C) Saturation of employment opportunities in agriculture sector
(D) Frequent failure of monsoons
(E) Slow growth in the prices of agricultural commodities
83. Which of the following are the benefits of GST ?
1. It will create Single Indian Market.
 2. It would improve the ease of doing business.
 3. Facilitate formalization of the economy.
- (A) 1 and 2 only (B) 2 and 3 only (C) 1 and 3 only
(D) All of the above (E) None of the above
84. 'The National Program on Artificial Intelligence' has been launched by which organization / body ?
- (A) Artificial Intelligence Task Force, Ministry of Commerce
(B) Ministry of Electronics and Information Technology
(C) NASSCOM
(D) NITI Aayog
(E) Cabinet Committee of Defence Affairs

85. Under Akbar, the Mir Bakshi was required to look after
 (A) Land Revenue System (B) The Royal Household (C) Military Affairs
 (D) The State Treasury (E) The Court Affairs
86. Who propounded the Theory of Economic drain of India was during British Imperialism ?
 (A) Jawaharlal Nehru (B) Bal Gangadhar Tilak (C) Sardar Vallabhbhai Patel
 (D) Dadabhai Naoroji (E) R.C. Dutt
87. Who founded the Asiatic Society of Bengal in Calcutta ?
 (A) Rajaram Mohan Roy
 (B) Sir William Jones
 (C) Warren Hastings
 (D) Keshabchandra Sen
 (E) Annie Besant
88. Which of the following statements is correct about Jainism ?
 (A) Jainism was founded by Vardhaman Mahavir.
 (B) The teachings of Jainism were taught in Pali and Sanskrit.
 (C) After a great famine in the Ganga valley, Bhadrabahu migrated to Karnataka along with his disciples.
 (D) The great King Ashoka was the chief patron of Jainism.
 (E) Varna system was practiced among followers of Jainism.
89. Which of the following statements is true about Lothal in Gujarat ?
 1. It is an important Indus Valley Civilization site discovered post-independence in Gujarat.
 2. Fire Altars have been found in the site.
 3. Earliest Dockyard and port.
 4. The Great Bath was discovered here.
 5. Found on the banks of River Indus.
 (A) All are correct (B) None is correct (C) 1,2,3,4 are correct
 (D) 1,2,3 are correct (E) 3,4,5 are correct



94. Which of the following pairs of islands is separated by the Ten degree channel ?
- Maldives and Lakshadweep
 - Nicobar and Sumatra
 - Sumatra and Java
 - Andaman and Nicobar
 - Gulf of Mannar and Sri Lanka
95. On the planet earth, most of the freshwater exists as ice caps and glaciers. Which is the other largest source of freshwater ?
- Soil moisture
 - Groundwater
 - Freshwater lakes and rivers
 - Atmospheric in the form of moisture and clouds
 - In plants
96. Salinization occurs when the irrigation water accumulated in the soil evaporates, leaving behind salts and minerals. What are the effects of salinization on the irrigated land ?
- It increases crop production
 - It raises the water table
 - It makes the soil impermeable
 - It fills the air spaces between soil
 - It results in excessive drainage
97. The big 4 cats – Tiger, Snow Leopard, Clouded Leopard and Common Leopard could be found in its natural habitat in which of the following State ?
- Arunachal Pradesh
 - Jammu & Kashmir
 - Mizoram
 - Karnataka
 - Uttar Pradesh

98. Consider the following statements with regards to Right for protection against arrest and detention :

1. This fundamental right is guaranteed both to citizens and non-citizens.
2. The rights guaranteed under this provision are applicable to those arrested under laws providing for preventive detention.
3. The rights guaranteed under this provision are not applicable to enemy aliens.

Which of the statements given above is/are correct ?

- (A) 1 and 3 only (B) 2 only (C) 2 and 3 only
(D) 3 only (E) 1, 2 and 3

99. Which one of the following matters stands excluded from the jurisdiction of Inter-State Council in India ?

- (A) Enquiring into and advising upon disputes which may have arisen between the States.
- (B) Adjudication of any dispute or complaint with respect to the use, distribution or control of water of, or in any inter-state river or river-valley.
- (C) Investigation and discussion of subjects in which some or all of the States or the Union and one or more States, have a common interest.
- (D) Recommendation on any such subject and in particular recommendation for a better coordination policy and action with respect to that subject.
- (E) None of the above

100. Consider the following statements about Micro plastics.

1. Plastic debris those are less than 5 nanometers length are called as Microplastics.
2. Microbeads are added as exfoliants to health and beauty products.
3. A recent study has confirmed Microplastics pollution in most of the water bottles.

Which of the statements given above is/are correct ?

- (A) 1 and 2 only
(B) 1 and 3 only
(C) 1, 2 and 3
(D) 2 and 3 only
(E) None of the three statements