NEW TREND BIOLOGY™

success without stress

COMBINED CLASS TEST - 12

Test Code 12

This paper contains 6 pages

Important Instructions :

1. The Answer Sheet is provided beside this Test Paper. When you are directed to open the Test Paper, fill in the particulars carefully with blue/black ball point pen only.
2. The test is of 45 minutes duration and Test Booklet contains 45 questions. Each question carries 4 mark. For each correct response, the candidate will get 4 marks. For each incorrect response, 1 mark will be deducted from the total scores. The maximum marks are 180.
3. Use Blue/Black Ball Point Pen only for writing particulars on this page/marking responses.
4. On completion of the test, the candidate must handover the Answer Sheet to the invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Paper with them.
5. The CODE for this Paper is 12. Make sure that the CODE printed on the Answer Sheet is the same as that on this Paper. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both are Test Paper and the Answer Sheet.
6. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your roll no. anywhere else except in the specified space in the Test Paper/Answer Sheet.
7. Use of white fluid for correction is NOT permissible on the Answer Sheet.

To be filled by Candidate

Name of the Candidate : _____

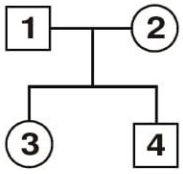
Roll Number : _____
(RTS I.D.)

Centre of Examination : _____

Candidate's Signature : _____

Date : **22 February, 2018**

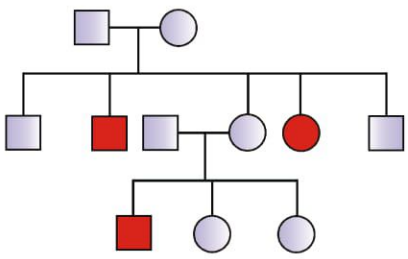
1. Segregation of mendelian factors (Aa) occurs during
   (A) Diplotene
   (B) Anaphase I
   (C) Zygotene/Pachytene
   (D) Anaphase II.
2. Percentage of recombination between A and B is 9%, A and C 17% and B and C is 26%. The arrangement of genes would be
   (A) A - B - C (B) A - C - B
   (C) B - C - A (D) B - A - C
3. It this figure which of the progeny is younger



   (A) 3 (B) 4
   (C) 2 (D) 1.
4. In lac operon genes a, i, y and z code for
   (A) Repressor protein, permease, b-galactosidase, transacetylase
   (B) Trsnsacetylase, repressor protein, permase, b-galactosidase
   (C) Trsnsacetylsse, permease, b-galactosidase, repressor protein
   (D) Permease , transacetylase, repressor protin, b-galactosidase.
5. Inulin occurs in the root of
   (A) Mango (B) Dahlia
   (C) Wheat (D) Sugarcane.
6. *Drosophila melanogaster* possesses
   (A) 3 pairs autosomes + 1 pair sex chromosomes
   (B) 2 pairs autosomes + 2 pair sex chromosomes
   (C) 1 pairs autosomes + 3 pair sex chromosomes
   (D) 2 pairs autosomes + 1 pair sex chromosomes
7. Match the columns I and II, and choose the correct combination from the options given

	Column I		Column II
a.	Pleiotropy	1.	Baldness
b.	Polygenic inheritance	2.	Pattern baldness
c.	Autosomal recessieve disorder	3.	Thalassemia
d.	Y-sex linked disorder	4.	Phenylketonuria
e.	Sex-influenced character	5.	Hypertrichosis
f.	Sex-limited character	6.	Human skin colour

   (A) a-5, b-3, c-2, d-1, e-6, f-4
   (B) a-4, b-6, c-3, d-5, e-1, f-2
   (C) a-4, b-6, c-3, d-5, e-2, f-1
   (D) a-6, b-4, c-5, d-3, e-1, f-2.
8. Read the statement regarding the lac operon and choose the correct option
   1. An inducer regulates the switching on and off of lac operon
   2. Repressor protein dissociates from operator region and prevents RNA polymerase from transcribing the operon
   3. In the presence of lactose, the repressor is activated by interaction with lactose
   4. RNA polymerase has access to the promoter and trancription proceeds only when the repressor is inactivated
   (A) 1 and 2 alone are correct
   (B) 2 alone is correct
   (C) 1 and 4 alone are correct
   (D) 3 and 4 alone are correct.
9. The organelle present in germinating seeds and connecting with β-oxidation or fat digestion is
   (A) Glyoxysome (B) Sphaerosome
   (C) Peroxisome (D) Mitochondrion.
10. Study of pedigree chart. What does it show



   (A) Inheritance of a condition like phenylketonuria as an autosomal recessive trait

(B) Inheritance of a recessive sex-linked disease like haemophilia

(C) Inheritance of sex-linked inborn error of metabolism like phenylketonuria

(D) Pedigree chart is wrong as this is not possible.

11. In sickle cell anaemia, the sequence of amino acids from first to seventh position of beta-chain of haemoglobin S (HbS) is

(A) His, Leu, Thr, Pro, Glu, Val, Val

(B) Val, His, Leu, Thr, Pro, Glu, Glu

(C) Glu, His, Leu, Pro, Val, Glu, Glu

(D) Val, His, Leu, Thr, Pro, Val, Glu.

12. Select correct statement about protein synthesis

(A) Translation begins when mRNA attaches to small subunit of ribosome

(B) Peptidase catalyses formation of peptide bond

(C) UTRs are present between start and stop codons

(D) At the end of translation, release factor binds to intiation codon.

13. Connective tissues are classified into

(A) Three types, viz., loose connective tissue, dense regular tissue and dense irregular tissue

(B) Two types, viz., areolar tissue, and adipose tissue

(C) Three types, viz., loose connective tissue, dense connective tissue and specialised connective tissue

(D) Four types, viz., blood, bone, cartilage and adipose.

14. Match the columns I and II, and choose the correct combination from the options given

Columns I (Medicinal plant)		Columns II (Family)
a.	*Aloe*	1. Brassicaceae
b.	Belladonna	2. Fabaceae
c.	Muliathi	3. Solananceae
d.	Ashwagandha	4. Liliaceae

(A) a-1, b-2, c-3, d-4 (B) a-4, b-3, c-2, d-1

(C) a-4, b-3, c-2, d-3 (D) a-4, b-2, c-3, d-3.

15. In humans, Philadelphia chromosome is formed by reciprocal translocation between chromosomes

(A) 9 and 21 (B) 9 and 22

(C) 9 and 20 (D) 20 and 10.

16. In ATG ACC AGG ACC CCA ACA sequence the first base gets mutated . It will effect

(A) Change in type and sequence of amino acids

(B) Change in first amino acid only

(C) No change

(D) No coding.

17. Vascular bundles of monocot stem are

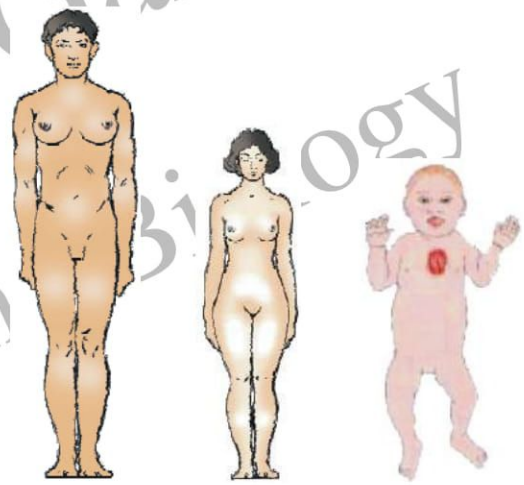
(A) Conjoint, collateral and open

(B) Conjoint, collateral and closed

(C) Conjoint, bicollateral and open

(D) Conjoint, concentric and closed.

18. Recognise the figure and find out the correct matching



(A) a-Down's syndrome, c-Klinfelter's syndrome, b-Turner's syndrome

(B) c-Down's syndrome, a-Klinfelter's syndrome, b-Turner's syndrome

(C) b-Down's syndrome, c-Klinfelter's syndrome, a-Turner's syndrome

(D) c-Down's syndrome, b-Klinfelter's syndrome, a-Turner's syndrome.

19. All the seven children of a couple are males. What is the probability that the eighth child will also be a male

(A) 1 / 2 (B) 1 / 4

(C) 1 / 8 (D) 1 / 16.

20. What is amino acid sequence encoded by base sequence UCA UUU UCC GGG AGU of mRNA segment

(A) Glycine– Serine– Phenylalanine– Serine– Glycine

(B) Serine– Phenylalanine– Serine– Glycine– Serine

(C) Serine– Phenylalanine– Glycine– Serine– Glycine

(D) Methioninei– Phenylalanine– Serine– Glycine– Serine.

21. Read the following statements and find out the incorrect statement.

(A) Dog fish have teeth that are modified placoid scales

(B) In Fighting fish gills are covered by operculum while in sting ray gill cover is absent

(C) Air bladder is present in saw fish which regulates buoyancy, while is Angel fish air bladder is absent

(D) Mouth of flying fish is terminal while that of great white shark is ventral.

22. Match the columns I and II, and choose the correct combination from the options given

Column I	Column II
a. Diphtheria	1. Kali Khansi
b. Leprosy	2. Gal ghotu
c. Whooping cough	3. Black death
d. Plague	4. Kusht rog

(A) a-1, b-2, c-3, d-4 (B) a-2, b-3, c-4, d-1

(C) a-2, b-4, c-1, d-3 (D) a-2, b-1, c-4, d-3.

23. Among seven pairs of traits studied by Mendel. The number of traits related to flower, pod and seed were

(A) 2, 2, 2 (B) 2 , 2, 1

(C) 1, 2, 2 (D) 1, 1, 2.

24. Select the correct statement

(a) RNA polymerase I transcrihes rRNAs

(b) RNA polymerase II transcribes snRNA

(c) RNA polymerase lll tranecribee hnRNA

(d) RNA polymerase II transcribes hnRNA

(A) a and d are correct

(B) b and c are correct

(C) a and b are correct

(D) a and c are correct.

25. The diploid sporophyte is represented by a dominant, independent, photosynthetic, vascular plant body. It alternates with multicellular, saprophytic/autotrophic, independent but short-lived haploid gametophyte. This type of pattern is exhibited by

(A) Bryophytes (*Sphagnum*, *Polytrichum*)

(B) Pteridophytes (*Selaginella, Lycopodium*)

(C) Most of the algal genera (*Fucus*, *Chara, Polysiphonia*)

(D) Seed plants (gymnosperms and angiosperms).

26. During analysis of the DNA of an organism having 5386 nucleotides find out- A = 29%, G = 17%, C = 32%, T = 17%. Considering the Chargaff's rule it can be concluded that

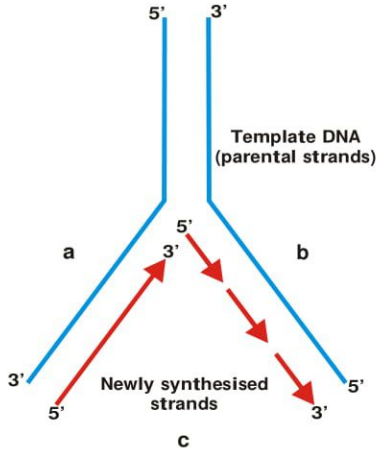
(A) It is double stranded linear DNA

(B) It is double stranded circular DNA

(C) It is single stranded DNA

(D) Both A & B.

27. Recognise the figure and find out the correct matching



(A) a-continuous synthesis, b-discontinuous synthesis, c-replication fork

(B) a-discontinuous synthesis, b-continuous synthesis, c-okazaki fragments

(C) a-continuous synthesis, b-discontinuous synthesis, c-okazaki fragments

(D) a-tempelate strand, b-coding strand, c-replication fork.

28. The genetic defect adenosine deaminase (ADA) deficiency may be cured permanently by

(A) Introducing bone marrow cells producing (ADA) into cells at an early embryonic stages

(B) Administrating adenosine deaminase activators

(C) Periodic infusion of genetically engineered lymphocytes having functional ADA *c*DNA

(D) Enzyme replacement therapy.

29. Read (i) to (v) and find the corect option

(i) Nitrogen base is linked to pentose sugar through N-glycosidic linkage

(ii) Phosphate group is linked to 5'- OH of a nucleoside through phosphoester linkage

(iii) Two nucleosides are linked through 3'-5' N-glycosidic linkage

(iv) Negatively charged DNA is wrapped around positively charged histone octamer to form nucleosome

(v) Chromatin that is more densely packed and stains dark is called euchromatin

(A) i, is, ii is wrong (B) iv along is wrong

(C) iii and v are wrong (D) i alone is wrong.

30. Match the columns

Column I	Column II
1. Sickle cell anaemia	a. 7^{th} chromosome
2. Phenylketonuria	b. 4^{th} chromosome
3. Cystic fibrosis	c. 11^{th} chromosome
4. Huntington's disease	d. X-chromosome
5. Colour blindness	e. 12^{th} chromosome

(A) 1 - a, 2- c , 3 - d, 4 - b , 5 - e

(B) 1 - c, 2- e , 3 - a, 4 - b , 5 - d

(C) 1 - b, 2- c , 3 - d, 4 - e , 5 - a

(D) 1 - b, 2- a , 3 - c, 4 - e , 5 - d.

31. In the *E. coli* cloning vector pBR 322 the number of selectable marker is

(A) 4 (B) 1

(C) 2 (D) 3.

32. The result of following experiment carried out by every et al on Streptococcus pneumoniae

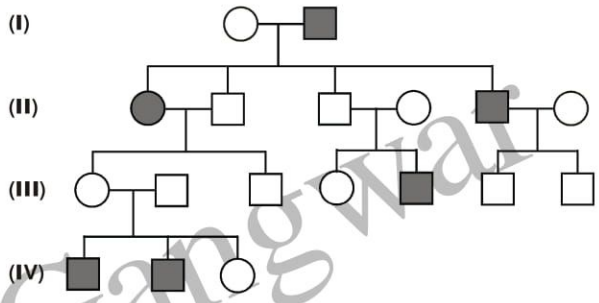
(A) Live 'R' strain + DNA from 'S' strain + DNAase

(B) Heat killed 'R' strain + DNA from 'S' strain + DNAase

(C) Live 'R' strain + DNA from 'S' strain + RNAase

(D) Live 'R' strain + Denatured DNA of 'S' strain + RNAase.

33. In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of given pedigree



(A) X-linked recessive

(B) Autosomal recessive

(C) X-linked dominant

(D) Autosomal dominant.

34. For studying and understanding language of honeybees, the scientist who was awarded Nobel Prize, was

(A) Rachael Carson (B) D. Muller

(C) Karl von Frisch (D) T. A. Loomis.

35. In which of the following will DNA melt at the lowest temperature

(A) 5'-AATAAAGC-3' (B) 5'-AATGCTGC-3'
3'-TTATTTCG-5' 3'-TTACGACG-5'

(C) 5'-ATGCTGAT-3' (D) 5'-GCATAGCT-3'
3'-TACGACTA-5' 3'-CGTATCGA-5'.

36. Which of the following vaccines are injected to babies at the age of 1½, 2½ and 3½ months

(A) Polio and BCG

(B) BCG an DPT-Hib

(C) DPT-Hib and Polio

(D) BCG and hepatitis B.

37. *Escherichia coli* with completely radioactive DNA was allowed to replicate in non-radioactive medium for two generations. Percentage of bacteria with radioactive DNA is

(A) 100% (B) 50%

(C) 25% (D) 12.5%.

38. Match the columns I and II, and choose the correct combination from the options given

	Column I		Column II
a.	Hershey and Chase experiment	1.	1928
b.	Taylor's experiment	2.	1952
c.	Meselson and Stahl experiment	3.	1958
d.	Transforming Principle	4.	1990
e.	Human Genome Project	5.	1953

(A) a-1, b-2, c-3, d-5, e-4

(B) a-2, b-3, c-5, d-1, e-4

(C) a-2, b-3, c-4, d-1, e-5

(D) a-2, b-3, c-3, d-1, e-4.

39. Select the correct sequences of steps in DNA finger printing involving Southern blot hybridisation using radiolabelled VNTR as proble

I. Hybridisation using labelled VNTR probe.

II. Isolation of DNA

III. Transferring (blotting) of separated DNA fragments to synthetic membranes, such as nitrocellulose or nylon.

IV. Detection of hybridisation DNA fragments by autoradiography.

V. Separation of DNA fragments by electrophoresis.

VI. Digestion of DNA by restriction endonucleases

(A) I, V, VI, II, III and IV

(B) II, VI, V, III, I and IV

(C) V, I, VI, III, IV and II

(D) II, I, V, VI, IV and III.

40. Sequence of AAT GCT TAG GCA on template segment of DNA will be represented overt the transcribed mRNA as

(A) UUA CGT TUC CGU

(B) AAT GCT AAG GCA

(C) UUA CGA AUC CGU

(D) TTA CGA ATC CGT.

Read the assertion and reason carefully to mark the correct option in question.

(A) If both assertion and reason are true and the reason is the correct explanation of the assertion

(B) If both assertion and reason are true but reason is not the correct explanation of the assertion

(C) If assertion is true but reason is false.

(D) If both assertion and reason are false.

41. Assertion : The relationship between genes and DNA are best understood by mutation studies

Reason : Frame shift mutation forms the genetic basis of proof that codon is a triplet and it is read in a contiguous manner.

42. Assertion : Mendelian disorders are transmitted to offspring on the same lines as in the principles of inheritance.

Reason : The pattern of inheritance of Mendelian disorders can not be traced in a family by the pedigree analysis

43. Assertion : Chromosome 1 has 231 genes and the y has 2968 genes.

Reason : Repetitive sequences of DNA are thought to have direct coding function and shed light on chromosome structure, dynamics and evolution.

44. Assertion : There is single DNA-dependent RNA polymerase that catalyses transcription of all types of RNA (mRNA, tRNA and rRNA) in eukaryotes.

Reason : In bacteria, there are at least three RNA polymerases are required.

45. Assertion : Origin of replication (ori) is a definite region in *E. coli* DNA where the replication originates.

Reason : The vectors in r-DNA procedures provide the origin of replication.