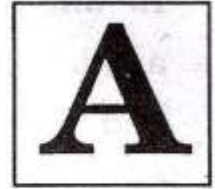


**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO**

**TEST BOOKLET SERIES**

**TEST BOOKLET**  
**A.P. (CC) BOTANY-2016**



Time Allowed : 2 Hours]

[Maximum Marks : 100

All questions carry equal marks.

**INSTRUCTIONS**

1. Immediately after the commencement of the examination, you should check that test booklet does not have any unprinted or torn or missing pages or items, etc. If so, get it replaced by a complete test booklet.
2. **Encode clearly the test booklet series A, B, C or D as the case may be in the appropriate place in the answer sheet.**
3. Write your Roll Number only in the box provided alongside.   
Do not write anything else on the Test Booklet.
4. This Test Booklet contains 100 items (questions). Each item comprises four responses (answers). Choose only one response for each item which you consider the best.
5. After the candidate has read each item in the Test Booklet and decided which of the given responses is correct or the best, he has to mark the circle containing the letter of the selected response by blackening it completely with Black or Blue ball pen. In the following example, response "C" is so marked :



6. Do the encoding carefully as given in the illustrations. While encoding your particulars or marking the answers on answer sheet, you should blacken the circle corresponding to the choice in full and no part of the circle should be left unfilled. After the response has been marked in the ANSWER SHEET, <sup>1/6</sup> erasing/fluid is allowed.
7. You have to mark all your responses ONLY on the ANSWER SHEET separately given according to 'INSTRUCTIONS FOR CANDIDATES' already supplied to you. Responses marked on the Test Booklet or in any paper other than the answer sheet shall not be examined.
8. All items carry equal marks. Attempt all items. Your total marks will depend only on the number of correct responses marked by you in the Answer Sheet. There will be no negative marking.
9. Before you proceed to mark responses in the Answer Sheet fill in the particulars in the front portion of the Answer Sheet as per the instructions sent to you.
10. If a candidate give more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct.
11. After you have completed the test, hand over the Answer Sheet only, to the Invigilator.

**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO**

Time Allowed : 2 Hours]

[Maximum Marks : 100

- In an ecosystem, what defines its composition of biological community, availability of water and nutrients, as well as the conditions such as light and temperature ?  
 (A) Function (B) Biotic potential  
 (C) Physiognomy (D) Structure
- The atmospheric growth rate of CO<sub>2</sub> in the decade 2005-2014 was :  
 (A) 0.73 ppm per year (B) 1.44 ppm per year  
 (C) 1.87 ppm per year (D) 2.11 ppm per year
- A log of wood in T.S. showed clear annual rings, uniseriate and multiseriate rays, tracheids and resin canals, but no vessels or fibres. It can be the wood of :  
 (A) *Gnetum* (B) *Quercus*  
 (C) *Pinus* (D) *Eucalyptus*
- Match the bryophyte and the mechanism of its spore dispersal :
 

Bryophyte	Mechanism
(p) <i>Funaria</i>	(i) Explosive mechanism
(q) <i>Riccia</i>	(ii) Hygroscopic elaters
(r) <i>Marchantia</i>	(iii) Peristome teeth
(s) <i>Sphagnum</i>	(iv) Decay or Shrivelling of calyptra and thallus tissue

Use the codes given below :

- (p)—(ii), (q)—(iii), (r)—(i), (s)—(iv)
- (p)—(iii), (q)—(iv), (r)—(ii), (s)—(i)
- (p)—(ii), (q)—(i), (r)—(iv), (s)—(iii)
- (p)—(iii), (q)—(ii), (r)—(i), (s)—(iv)



5. Which of the following groups is reported to show pollination by insects as well as wind ?
- (A) Cycadales (B) Coniferales  
(C) Ephedrales (D) Poales
6. Long shoots with pycnoxylic wood and dwarf shoots with manoxylic wood are seen in :
- (A) *Cycas revoluta* (B) *Pinus roxburghii*  
(C) *Ginkgo biloba* (D) *Taxodium mucronatum*
7. According to most recent estimates the total number of known angiosperm species is about :
- (A) 1.5 lakhs (B) 3 lakhs  
(C) 4.5 lakhs (D) 6 lakhs
8. Cell wall of diatoms is rich in :
- (A) Calcium (B) Lignin  
(C) Silica (D) Alginic acid

9. *Amborella trichopoda* is now widely considered as :
- (A) Oldest known fossil of an angiosperm
  - (B) Most primitive living angiosperm
  - (C) Most primitive living vascular plant
  - (D) Oldest known fossil of a seed plant
10. Which one of the following lists all phytoplanktons ?
- (A) *Hydrilla, Azolla, Spirodella, Lemna, Wolffia*
  - (B) *Lecane, Asplanca, Euglena, Cyclops, Brachionus*
  - (C) *Pythium, Alternaria, Cladosporium, Trichoderma, Saprolegnia*
  - (D) *Volvox, Microcystis, Spirulina, Zygonema, Oedogonium*
11. Of the three types of ecological pyramids, the pyramid of energy is considered to give the best assessment of the nature of ecosystem because :
- (A) Energy is indestructible
  - (B) Pyramid of energy is always upright
  - (C) It represents the rates of passage of food mass through the food chain
  - (D) Number and biomass are more difficult to measure than the flow of energy

12. The sequence of steps in the process of succession is :
- (A) Migration → Ecesis → Aggregation → Reaction → Stabilization  
 (B) Reaction → Aggregation → Ecesis → Migration → Stabilization  
 (C) Ecesis → Migration → Aggregation → Stabilization → Reaction  
 (D) Aggregation → Stabilization → Migration → Aggregation → Ecesis
13. A unique symbiotic association between a pteridophyte and a cyanobacterium is utilized in agriculture for cultivation of :
- (A) Jute (B) Rice  
 (C) Soybean (D) Cotton
14. Match the life cycle patterns of some algae and their suitable examples :

Life Cycle	Algae
(p) Haplobiontic with zygotic meiosis	(i) <i>Fucus</i>
(q) Diplobiontic, isomorphic	(ii) <i>Laminaria</i>
(r) Diplobiontic, heteromorphic	(iii) <i>Oedogonium</i>
(s) Haplobiontic, with gametic meiosis	(iv) <i>Dictyota</i>

Use the code given below :

- (A) (p)—(ii), (q)—(i), (r)—(iii), (s)—(iv)  
 (B) (p)—(i), (q)—(iii), (r)—(ii), (s)—(iv)  
 (C) (p)—(iv), (q)—(iii), (r)—(i), (s)—(ii)  
 (D) (p)—(iii), (q)—(iv), (r)—(ii), (s)—(i)

15. Rod-shaped bacteria are called :

(A) Spirilla

(B) Cocci

(C) Bacilli

(D) Vibrios

16. Similar traits evolved due similar selection pressure acting on similar gene pools represent :

(A) Convergent evolution

(B) Co-evolution

(C) Parallel evolution

(D) Divergent evolution

17. The flowering plants are believed to have appeared in the cretaceous period which occurred around :

(A) 70 million years ago

(B) 135 million years ago

(C) 300 million years ago

(D) 380 million years ago

18. A piece of nucleic acid employed to find a gene by forming a hybrid with it is called :

(A) Probe

(B) Primer

(C) Marker

(D) Transcript



19. Where the specific epithet exactly repeats the generic name, the plant name is considered illegitimate because it is a/an :
- (A) Homonym (B) Autonym  
(C) Tautonym (D) Typonym
20. When red-flowered snapdragons are crossed with white-flowered, the offspring has pink flowers. This type of genotypic expression is because of :
- (A) Codominance (B) Incomplete dominance  
(C) Multi-allelic inheritance (D) Dominant-recessive pattern
21. Number of cells in the Quiescent Centre of RAM in *Arabidopsis thaliana* is :
- (A) 4 (B) 8  
(C) 16 (D) 32
22. Which cells in an angiosperm are most comparable to the stem cells of mammals ?
- (A) Central mother cells of stem apex  
(B) Vascular cambium  
(C) Initials around the quiescent centre  
(D) Phellogen

23. A specimen or other element used by the author or designated by him as the nomenclatural type is :
- (A) Isotype (B) Paratype  
(C) Lectotype (D) Holotype
24. A dye extracted from which of the following is used to impart a light-yellow tinge to a popular brand of butter in India ?
- (A) *Haematoxylon campechianum* (B) *Terminalia chebula*  
(C) *Bixa orellana* (D) *Carthamus tinctorius*
25. One annual ring of secondary xylem has :
- (A) Sapwood and heartwood  
(B) Springwood and autumn wood  
(C) Softwood and hard wood  
(D) Tension wood and compression wood
26. Which of the following shows secondary growth by successive cambia ?
- (A) *Boerhaavia diffusa* (B) *Aristolochia triangularis*  
(C) *Thunbergia coceinea* (D) *Serjania corrugata*



27. Which of the following methods of genetic transformation has proved most successful with crop plants ?

- (A) Electroporation
- (B) Use of *Agrobacterium tumefaciens*
- (C) Microprojectile bombardment
- (D) Microinjecting DNA

28. What is the purpose of use of selectable marker or reporter genes ?

- (A) Receive a signal that gene transfer has been accomplished as desired
- (B) Control the expression of the gene of the desired trait in the targeted organ or tissue
- (C) Selection of transformed cells from amidst non-transformed cells
- (D) Determine the precise site on a host chromosome where gene introgression has occurred

29. Which among the following yields a dye as well as edible oil, and is also used as a substitute or adulterant of saffron ?

- (A) *Lawsonia inermis*
- (B) *Tegetes patula*
- (C) *Isatis tinctoria*
- (D) *Carthamus tinctorius*

30. Which part of *Podophyllum hexandrum* is used for extraction of podophyllotoxin used against tumours ?
- (A) Root (B) Stem  
(C) Flowers (D) Seeds
31. Recalcitrant seeds are those which :
- (A) Remain dormant for long periods  
(B) Show a high degree of sterility  
(C) Require cold treatment for germination  
(D) Get killed on drying or freezing
32. A demulcent is a drug that :
- (A) Calms the nerves and induces sleep  
(B) Enhances appetite and digestion  
(C) Soothes skin and mucous membrane  
(D) Increases the discharge of urine
33. Gymnospermous wood is designated softwood because :
- (A) Resin ducts make it weak  
(B) Fibers are lacking  
(C) Vessels are absent  
(D) Excess of axial parenchyma is present

34. Reserpine finds maximum use in treatment of :

- (A) Kidney disfunction (B) Blood cancer  
(C) Hepatitis A (D) Mental disorders

35. Apple is pollinated by :

- (A) Bees (B) Butterflies  
(C) Wasps (D) Moths

36. Match the fruit and its morphological type :

Fruits	Type
(p) Papaya	(i) Pepo
(q) Fig	(ii) Drupe
(r) Coconut	(iii) Berry
(s) Pumpkin	(iv) Syconium

Use the code given below :

- (A) (p)—(ii), (q)—(i), (r)—(iv), (s)—(iii)  
(B) (p)—(iii), (q)—(iv), (r)—(ii), (s)—(i)  
(C) (p)—(iv), (q)—(ii), (r)—(i), (s)—(iii)  
(D) (p)—(ii), (q)—(iv), (r)—(i), (s)—(iii)



37. Processing for green tea requires :
- (A) Crushing to ensure complete mixing of enzymes
  - (B) Drying fresh leaves to retain green colour
  - (C) Tearing and warming of leaves for better fermentation
  - (D) Heating freshly picked leaves to inactivate enzymes
38. Obtaining rare hybrids is one of the important applications of culture of :
- (A) Ovule
  - (B) Embryo
  - (C) Endosperm
  - (D) Pollen
39. Among linseed, castor, soybean and mustard how many are drying or semidrying oils ?
- (A) One
  - (B) Two
  - (C) Three
  - (D) All four
40. Which part of the stem bears the fibers of jute ?
- (A) Cortex
  - (B) Phloem
  - (C) Xylem
  - (D) Pith

41. In citrus and mango adventive embryos arise from :

- (A) Nucellus (B) Integument  
(C) Endosperm (D) Antipodal cells

42. Match the species and its method of seed dispersal :

- (p) *Impatiens parviflora* (i) Zoochory  
(q) *Oroxylum indicum* (ii) Autochory  
(r) *Viscum album* (iii) Myrmechory  
(s) *Anemone nemerosa* (iv) Anemochory

Use the codes given below :

- (A) (p)—(i), (q)—(iii), (r)—(ii), (s)—(iv)  
(B) (p)—(iii), (q)—(ii), (r)—(i), (s)—(iv)  
(C) (p)—(iv), (q)—(iii), (r)—(ii), (s)—(i)  
(D) (p)—(ii), (q)—(iv), (r)—(i), (s)—(iii)

43. Which of the following is the most widespread and effective adaptation to prevent self-pollination ?

- (A) Unisexuality (B) Dichogamy  
(C) Self-incompatibility (D) Herkogamy

44. In cereals, the aleurone grain contains :
- (A) Carbohydrates only
  - (B) Carbohydrates and lipids only
  - (C) Lipids and proteins only
  - (D) Carbohydrates, lipids and proteins
45. In the cap block region of the growing pollen tube, which of the following shows maximum abundance ?
- (A) Mitochondria
  - (B) Golgi apparatus
  - (C) Golgi vesicles
  - (D) Starch grains
46. To generate somaclonal variation one has to use :
- (A) Chemical mutagens
  - (B) R-DNA technology
  - (C) Tissue culture
  - (D) Marker-assisted breeding
47. One of the functions of tyloses is to :
- (A) Defend against pathogens
  - (B) Increase tensile strength of wood
  - (C) Slow down the process of heartwood formation
  - (D) Ensure continued conduction of water



48. Biotrophs are organisms that :

- (A) Produce harmful chemicals and toxins in organisms that they parasitize
- (B) Cause no significant harm to the host while deriving nutrients from it
- (C) Take shelter on an organism but do not derive nutrients, nor produce any harmful compounds that can harm the host
- (D) Live independently and manufacture their own food

49. Which one of the following statements about DNA is *wrong* ?

- (A) Diameter of DNA is constant
- (B) Amount of DNA is constant per haploid set of chromosomes in cells of a species
- (C) There are three hydrogen bonds between adenine and thymine, and two hydrogen bonds between guanine and cytosine
- (D) DNA invariably contains equivalent amounts of purines and pyrimidines

50. Raffinose on hydrolysis yields :

- (A) Sucrose and maltose
- (B) Glucose and fructose
- (C) Glucose + glucose and fructose
- (D) Glucose, fructose and galactose

51. Apple scab is caused by :
- (A) *Leptosphaeria sacchari*                      (B) *Podosphaera leucotricha*  
(C) *Erysiphe cruciferatum*                      (D) *Venturia inaequalis*
52. Symptoms of fire blight of apple and pear are seen on :
- (A) Leaves and buds only  
(B) Twigs and bark of mature trees  
(C) Fruit only  
(D) All parts of the tree
53. Bordeaux mixture is prepared by reaction of copper sulphate with :
- (A) Lime and sulphur                      (B) Dithiocarbamic acid  
(C) Calcium hydroxide                      (D) Methyl bromide
54. In which of the following, human beings have minimal rights ?
- (A) Biosphere Reserves  
(B) Wildlife Sancturries  
(C) National Parks  
(D) Wetlands under Ramsar Convention

55. A frameshift mutation results from :
- (A) Alteration in sequence of bases
  - (B) Change in normal base pairing pattern
  - (C) Conversion of one base into another
  - (D) Addition or deletion of a base pair in the nucleotide sequence
56. APG IV gives an update on classification of angiosperms at the level of :
- (A) Species and genera
  - (B) Genera and families
  - (C) Families and orders
  - (D) Orders and classes
57. Which one of the following is common in India and is *not* a rooted aquatic fern ?
- (A) *Salvinia*
  - (B) *Pilularia*
  - (C) *Marsilea*
  - (D) *Regnellidium*
58. Where do you expect the presence of passage cells ?
- (A) Mesophyll of pine needles
  - (B) Endodermal cells of roots
  - (C) Tip of nucellus in angiosperm ovules
  - (D) Archegonia of bryophytes and pteridophytes



59. Where the solvent moves through fixed and charged particles under the influence of an electrical potential gradient, it is called :
- (A) Electrophoresis (B) Electro-osmosis  
(C) Endosmosis (D) Reverse osmosis
60. Heterostyly is an adaptation for :
- (A) Extending the duration of flowering  
(B) Capturing larger number of pollen grains  
(C) Preventing self-pollination  
(D) Utilizing maximum diversity of pollinators
61. Which of the following groups of Trachaeophyta did not contribute to the huge coal deposits formed in carboniferous period ?
- (A) Horsetails (B) Lycopods  
(C) Conifers (D) Dicots
62. Which among the following are archaebacteria ?
- (A) Methanogens (B) Pseudomonads  
(C) Chlamydias (D) Purple non-sulfur

63. The mass of streaming protoplasm in slime molds having diploid nuclei is called :
- (A) Macrocyst (B) Pseudoplasmodium  
(C) Plasmodium (D) Paramylum
64. Which of the following enzymes functions with optimum efficiency at low pH ?
- (A) Pepsin (B) Lipase  
(C) Trypsin (D) Urease
65. Tryphine and pollen kitt substances are synthesized by :
- (A) RER in vegetative cell (B) Plastids in generative cell  
(C) Plastids in tapetal cells (D) RER in tapetal cells
66. A mature, functional sieve element possesses :
- (A) Nucleus, mitochondria, golgi apparatus and ribosomes  
(B) ER, mitochondria, proplastids and slime  
(C) Nucleus, plastids, ribosomes and slime  
(D) Golgi apparatus, plastids, microtubules and mitochondria

67. Which of the following statements is *not* true for chromosome mapping ?
- (A) It helps to determine sequence and relative distance of genes
  - (B) Percentage of crossing-over between two genes indicates their relative distance
  - (C) Genes located farther apart in a chromosome undergo least crossing-over, compared to genes located nearby
  - (D) Chromosome map is also called genetic map
68. The part of mushroom that is seen above the ground is called :
- (A) Ascocarp
  - (B) Ascogonium
  - (C) Sporangium
  - (D) Basidiocarp
69. *Nepenthes* and *Drosera* capture insects to meet their requirements of :
- (A) Carbohydrates
  - (B) Fats
  - (C) Proteins
  - (D) Salts
70. Zinc is essential for :
- (A) Nitrogen fixation
  - (B) Biosynthesis of indole-3-acetic acid
  - (C) Membrane function
  - (D) Stomatal mechanism

71. Which of the following has *not* been implicated in the opening of stomata ?

- (A) Mineral salts brought up by transpiration stream
- (B) Disappearance of starch from guard cells
- (C) Production of organic acids such as malic acid
- (D) Uptake of  $K^+$  ions in guard cells

72. Which of the following is *not* a characteristic of  $C_4$  plants ?

- (A) Photorespiration is absent
- (B) First stable product of photosynthesis is a 3-carbon compound, phosphoglyceric acid
- (C) Chloroplasts are dimorphic
- (D) Calvin cycle occurs in the cells of bundle sheath only

73. Chief source of auxins in a plant is/are :

- (A) Leaves
- (B) Cambium
- (C) Pith of stem
- (D) Shoot apex



74. Enzymes or forms of an enzyme that have different molecular structure but catalyze the same reaction are called :
- (A) Isoenzymes (B) Allosteric enzymes  
(C) Multienzyme complexes (D) Isomerases
75. In which of the following types, the embryo sac has 16 nuclei, with a 3-celled egg apparatus and two polar nuclei ?
- (A) Peperomia (B) Penaea  
(C) Drusa (D) Fritillaria
76. A tree has large red, cup-shaped, odourless flowers, having plenty of nectar, sticky pollen and with stamens and pistil projecting beyond the perianth. It is likely to be pollinated by :
- (A) Moths (B) Butterflies  
(C) Birds (D) Bats
77. Most of the Rhodophyta live in :
- (A) Freshwater lakes  
(B) Springs and streams  
(C) Cool coastal waters of the sea  
(D) Warm coastal waters of ocean

78. A facultative heliophyte :

- (A) grows best in shade, but can grow well in bright sunlight
- (B) grows best in sun, but can also grow well in shade
- (C) grows best in alkaline soil, but can grow well in neutral and slightly acidic soil
- (D) is a seasonal plant, but can grow like a perennial if suitable environmental conditions are provided

79. In mosses and ferns, the archegonia are able to receive the sperms because of :

- (A) Chemical secretions
- (B) Water currents
- (C) Opposite electric charges
- (D) Flagellated sperms getting caught in numerous thread-like emergences of archegonia

80. Pedogenesis is :

- (A) Process of soil degradation due to pollution
- (B) Changes in climax vegetation due to alterations in climate
- (C) Loss of function of an organ due to disuse
- (D) Process of soil development

81. In which District of H.P. are Rahalla waterfalls ?
- (A) Bilaspur (B) Hamirpur  
(C) Kullu (D) Chamba
82. Approximately how much rainfall does Dharamsala town of H.P. get in a year ?
- (A) 2200 mm (B) 3400 mm  
(C) 3900 mm (D) 4500 mm
83. Which of the following is *not* usually sown in H.P. during the Kharif season ?
- (A) Cotton (B) Sugarcane  
(C) Urad (D) Lentil (Masoor)
84. What was the number of districts in H.P. after the transfer of certain areas of Punjab in November, 1966 ?
- (A) 7 (B) 8  
(C) 9 (D) 10
85. Who is the author of "*Of Mountains and Men*" ?
- (A) K. Maitra (B) G.D. Khosla  
(C) H.K. Mitto (D) K.L. Joshi

86. Rulers of which of the following princely states of Kangra region belonged to *Suryavanshi* race ?
- (A) Guler (B) Siba  
(C) Jaswan (D) None of these
87. In which region of H.P. is Marechh Devata worshipped ?
- (A) Hamirpur—Sujanpur (B) Arki—Kunihar  
(C) Kumarsain—Kotgarh (D) Bilaspur—Sundernagar
88. Which District of H.P. recorded negative decennial growth rate in population between 2001 and 2011 ?
- (A) Kinnaur (B) Shimla  
(C) Kullu (D) Lahaul-Spiti
89. Girls of which age-group are covered in *Kishori Shakti Yojna* in H.P. ?
- (A) 10 to 16 years (B) 11 to 18 years  
(C) 12 to 20 years (D) 14 to 22 years
90. At which place in Bilaspur District of H.P. a hydro engineering college is proposed to be set up ?
- (A) Bandla (B) Dabla  
(C) Marottan (D) Kandraur



91. With which of the following is Bezwada Wilson, the winner of Magsaysay Award associated ?
- (A) Safai Karmachari Andolan  
(B) Child Rights  
(C) Anti-pollution movement  
(D) Climate change
92. In which state of India is Chilka lake ?
- (A) J and K (B) Uttarakhand  
(C) Odisha (D) Sikkim
93. When was *Pradhan Mantri Jeevan Jyoti Yojna* launched ?
- (A) May 9, 2015 (B) August 15, 2015  
(C) October 2, 2015 (D) December 12, 2015
94. With which game/sport is Narsingh Yadav associated ?
- (A) Weight lifting (B) Boxing  
(C) Wrestling (D) Shooting
95. According to 2011 census, what is the female literacy rate in India ?
- (A) 53.67 percent (B) 59.45 percent  
(C) 65.46 percent (D) 69.97 percent

96. What do the five rings or circles in the Olympic flag signify ?
- (A) Countries (B) Nations  
(C) Geographical areas (D) Races
97. Who was Abdul Sattar Edhi ?
- (A) Bangladeshi writer  
(B) An Afghan tribal leader  
(C) A Pakistani philanthropist  
(D) A Syrian philosopher
98. Which day is observed as International Day of Happiness ?
- (A) 14th February (B) 20th March  
(C) 18th April (D) 12th July
99. How many countries are members of SAARC ?
- (A) 6 (B) 7  
(C) 8 (D) 9
100. Who is Bidhya Devi Bhandari ?
- (A) Progressive writer of West Bengal  
(B) President of Nepal  
(C) T.V. Actor of Bhojpuri Cinema  
(D) None of the above