Roll No.
m.r ;t. |

Candidates must write the Code on the title page of the answer-book.

tRranW ep)-g. q;) ~~~Cbl   m ~-'PO
tR~.fff&   I

- Please check that this question paper contains 11 printed pages.

- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.

- Please check that this question paper contains 30 questions.

- Please write down the Serial Number of the question before attempting it.

- 15 minutes time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer script during this period.

- ~. ~ ~ B ~ ~ >rv.T-~ ~ ~   1f'8" 11 ~. I

- >rv.T--q;f ~ ~   ~ c.tr am: ~ ~ cnT:s ~ ~ ~ ~-~ff{jCf)1 ih ~-~   1R ~   I

- ~   ~ ~ B ~ ~ >rv.T--q;f ~ 30 >rv.T ~ I

- ~   ~ q;y am- Wt&41 ~ ~ ~ ~, ~ q;y ~ ~ ~ I

- ~ >rv.T-~ ~ ~ ih ~ 15 fi:Rc qa ~ ~ llCIT ~ I >rv.T-~ q;r fcRrorr ~ ~ 10.15 ~ fcfi!rr ~ I 10.15 ~ ~ 10.30 ~. w:fi ~ m- >rv.T--q;f ~ ~ aW: ~ 3lCW:l ih m ~~-f@Cf)1   1R ~   6m: ~ ~

BIOLOGY (Theory)

~   ra$1l~ <"'ca>IPdCf»

Time allowed : 3 hours   *Maximum Marks : 70*

~3fq;:   *70*

General Instructions:

(i)   All questions are compulsory.

(ii)   This question paper consists of four Sections A, B, C and D. Section A contains 8 questions of **one** mark each, Section B is of **10** questions of **two** marks each, Section C is of 9 questions of **three** marks each and Section D is of 3 questions of **five** marks each.

(iii)   There is no overall choice. However, an internal choice has been provided in one question of 2 marks, one question of 3 marks and all the three questions of 5 marks weightage. A student has to attempt only one of the alternatives in such questions.

(iu)   Wherever necessary, the diagrams drawn should be neat and properly labelled.

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t/1I1IP4   ~   :

●

(ii)   S« JrR-W if TJTJ: ?ffTIS *A, B,* C 3ik D *t* I ?ffTIS *A* if 8 JrR *t* ~   J{"firqj CfiT ~   ~~,   ?ffTIS *B* if 10 JrR *t* fir;rif J{"firqj *if;* ~ ~   1, ?ffTIS C *if* 9 JrR ; ~   J{"firqj *if; rft;r* ~   *t* (fPH ?ffTIS *D* if 3 JrR ; f.5Frif J{"firqj *if;* ~~~·I

(iii)   qir{"fTi{1{ ~-fcrq;fq   *(.aiffr* ~) ~   ;rtf ~ I f1:F;r W, 2 *afrif* cm:r 7!,Cfi JrR *if,* 3 *afrif* cm:r 7!,Cfi JrR ;,.: 3ik 5 *afrif* cm:r "f11ft rft;ff m *if* 'Jftrrft ~-fcrq;fq   ~ W:*t* I rljt m *if* ~   q;f *itcrfr* 7!,Cfi ift fcrq;fq CfiT 6ff1: ~ ~ I

(iv)   lifQf '4t 3"I7q~4i:f) *it,* ~   iifR cm:r 317& W!6-~   (fPH ~rl   .(i\r[*if* rnqjfq,rl "if I

SECTION A
~A

1. Name the embryonic stage that gets implanted in the uterine wall of a human female. **1**

   ~ ~ ~ CIIT ";{111 ~ ~ m;rq W q,l ~. Nfu -q al(1UN(I M ~ ~

2. State the importance of biofortification. **1**

   ;5lq5lil:l~ICfi<ol CIIT ~ ~ |

3. Biotechnologists refer to *Agrobacterium tumifaciens* as a natural genetic engineer of plants. Give reasons to support the statement. **1**

   ;5lq5l1Wnlc:h1fclG *l!,mkfR2Ilj 'i_4J.rhf8l!,rf◁it* ~ CIIT ~ 511i!llffiCfi 3ilj~~ICfi $\IIIR~< ~

   ~ -q ~ ~ | ~ q;~ ~ ~ -q oct ~. ~ |

4. How do algal blooms affect the life in water bodies ? **1**

   ~ 51~G;{j "B 'M1<l~141 -q ~ ~ >!CliR ~ mm ~ ?

5. Name the common ancestor of the great apes and man. **1**

   4~ICfiNl(j ~ llRCf ~ m ~ CIIT ";{111 ~ |

6. Write a difference between net primary productivity and gross productivity. **1**

   ~ (~) 51ll!llf~Cfi 3(GlGCfiHl ~ ~ 3(G lGCfi(ll -q .~ aim: ~

7. Mention the contribution of genetic maps in human genome project. **1**

   llRCf ~ ~ 'ij 3ilj~~ICfi 4l'1fil:fl CIIT t{lllGl'i ~ |

8. Name the phase all organisms have to pass through before they can reproduce sexually. **1**

   ~ ~ ~ ~ ~ \IFR "Cfi\ M, ~ ~ ◁it ~ ~ >lTcW-TT ~ ~ ~

   ~, ~ ";{111 ~ |

9. Name the enzyme produced by *Streptococcus* bacterium. Explain its importance in medical sciences. 2

   ¥l2)CiiT#ff ~ rn ~ ~ ~ ~ CfiT ;w:r ~ I r~rCf)ffil ~ .q;
   ~ ~ tlG~I~Q> I

10. How is 'Rosie' considered different from a normal cow ? Explain. 2

    '~' qj) ~ ~ IJ'T'r ~ fcnB >rtfiR N?r 11RT ~ ~ ? tlG~I~t(

11. State the use of Biodiversity in modern agriculture. 2

    ~ ~ .q: ~-fcffcfmrr CfiT ~ ~ I

12. Write the full form of VNTR. How is VNTR different from 'Probe' ? 2

    VNTR qj) lU-lU ~ I VNTR '~' ~ fcnB >rtfiR Mo;;r mm ~ ?

13. Differentiate between benign and. malignant tumours. 2

    ~ (~) ~ -W.rr ¢r (~r~jl~'2) ~ .q: fcNG ~

14.

    i

    Area-e-»

    The above graph shows Species-Area relationship. Write the equation of the curve 'a' and explain. 2

    OR

    Differentiate between *ui situ* and *ex situ* approaches of conservation
    ı of biodiversity.

~ ~ ~ mtfi -q ~-~ **m GW:rr** 7JGIT ~ । Cfffii 'a' CfiT ~41Cfl{Ol ~ **am:** ~4~1~q: ।

31~

~-~ **iii** *f4f!1.1f.f* ~ *41@'P-lR* ~ ~ -q fcMG ~

15. The cell division involved in gamete formation is not of the same type in different organisms. Justify. 2

~ **iii** ~ -q ~ chli1llCfll ~ ~ ~ -q ~ ~ **m m** CfiT ~ ~ । ~ ~ ~ **m** ~141RH1 ~ ? ~ ।

16.

Identify the type of the given ecological pyramid and give one example each of pyramid of number and pyramid of biomass in such cases. 2

~ ~ 7JGIT qlRr~roct1 **fiwfils** ~ **m** CfiT ~, qilillRq: ~ ~ man -q ~ **cnrflwfils** ~ ~Cf:gilrn **it flwfils** CfiT ~-- ae:lt?,(ol ~ ।

17. Describe the Lactational Amenorrhea method of birth control. 2

~ **·Frtrrr** Cbl ~'NI'i ~ (~c:g~I'iC1 QilrnRJ:lI) ~ CfiT "Cf1Jf.:r ~

18. Name the type of bioreactor shown. Write the purpose for which it is used. 2

~   ~ ~141n:Qcg< ~ wm: qjT ~   ~   I ~ fciiu ~   ~ ft;m: CfiTlf -q ~ ~~,~I

SECTION   C

~C

19. Draw a labelled diagram of the reproductive system in a human ferilale. 3

II"RCI" -m ~ ~   ~ q;r ~   ""l1l'iifchd ~   ~   I

20. Branching descent and natural selection are the two key concepts of Darwinian Theory of Evolution. Explain each concept with the help of a suitable example. 3

fq ~1I@41 3iCl(I~o I (f~   IWf;f(1Cf1 q{Uf, ~   ~ fcfcmJ ~ 1ffi CfiT ~ ~   <8Cfl('q ""IⱵ ~
~ ~   3~,,~<ol CfiT '8~I~dl ~ ~   ~ .~   <8Cfl('q ""I '8l'i~I~q: I

21. Scientists have succeeded in recovering healthy sugarcane plants from a diseased one.

   (a) Name the part of the plant used as explant by the scientists.

   (b) Describe the procedure the scientists followed to recover the healthy plants.

   (c) Name this technology used for crop improvement.   3

   fc!;Bt ~ 7ffl ih ~ ~ :fIT ~ 7ffl ih tfTil ~ cnB -q: ~~IIRCfl ~ M -rro: ~I

   (a) -q]il ih ~ 'qf1T q;r ;m:r ~ ~ ~;~IIf.1chi ;r CflnTdctl (Q>CF8 C<.li2) ih ~ if $~ Ji1(1 fcfi<rr ~ I

   (b) ~ tfTm qit g.,:sllfl{i ih ~ ~~If.1chi ~ ~ Cfl14fc1R:T~ ~ crrrR ~I

   (c) ~ ih "f!m{ ih ~ $~Ji|0 ctt ~ CiWft ~ S!1rilfllCfll q;r ;m:r ~ I

22. (i) Name the enzyme that catalyses the transcription of hnRNA.

   (ii) Why does the hnRNA need to undergo changes ? List the changes hnRNA undergoes and where in the cell such changes take place.   3

   (i) ~ ~ q;r ;m:r ~ ~ hnRNA ih 3ij~{g" (?i~rn>~H) q;r ~ ~~ I

   (ii) hnRNA if qRqd., ~ qit 3ilq~llCfldl ~ MM ~ ? hnRNA if ~ ~ QRqd'1'j ctt ~ ~ a:m ~ fcf; ~ qRqd., ctJl~ICfll ih 'lfuR ~ ~ ~I

23. (i) Write the scientific names of the two species of filarial worms causing filariasis.

   (ii) How do they affect the body of infected person(s) ?

   (iii) How does the disease spread ?   3

   (i) ~1~~RQf:ttfl ~ cnB ~ %I~~R~ ~ ctt ~ 'tXfl~nlJ1 ih ,~~If~Cfl ;wr ~I

   (ii) fi~fiid OllRfi4'i ih mR CfiT .q fcfiB m ~ ~ ~?

   (iii) ~ WI ~ m ~ ~?

24. Name the genus to which baculoviruses belong. Describe. their role in the integrated pest management programmes. 3

~ chr (~) CfiT .;n11 ~   ~   ~   ~ll~ql~Hi ~ ~ I ~ttld ~   ~
mm-m # ~   ~   ~Ji~I$l!> I

25. Unambiguous, universal and degenerate are some of the terms used for the genetic code. Explain the salient features of each one of them. 3

~ljcj~l~   ~   ih ft;rQ: ~,   ~   O?lT 3iq~lr~d ~ ~ ~ $@Jil(1 ~
~ ~ I ~ ~ ~   ih ~ -q ~ ~   ~Ji~l~l!> I

26. Water is very essential for life. Write any three features both for plants and animals which enable them to survive in water scarce environment. 3

OR

How do organisms cope with stressful external environmental conditions which are localised or of short duration ?

~ ~   ih ft;rQ: ~   ~   ~. I t11m am: >nfTrT<if :$IT ~ ~ ~   "ffi;r--aR ~
~   ~   IDU ~ ~-3Nfq   ~   q~fq{ol -q ijftf ffi aR ~ ~ I

31?ICIT

~ d'1lq'iuf ~   q~fq{oil~ ~   ~ >Ifu ~ ~   mm ~ 3l?fCIT 3i(?q~lrfl~
mm ~, ~   fcfiB" >rCfiT{ ~   ~ ?

27. (i) State the consequence if the electrostatic precipitator of a thermal plant fails to function. .

. (ii) Mention any four methods by which the vehicular air pollution can be controlled. 3

(i) ~ ~. OfCf-~ **rn** CfiT ---   ~   q)J11 ~   ~ q)'\ ~ **Of** ~
~I

(ii) ~ ~ T.JR fclT~ ~ ~ IDU ~ .~ ~ f.1~(1~ ~ ~ ~
em f.14fStd fcnlrr ~ ~   ~ I

SECTIOND
~D

28. Give reasons why:

    (i) most zygotes in angiosperms divide only after certain amount of endosperm is formed.

    (ii) groundnut seeds are exalbuminous and castor seeds are albuminous.

    (iii) Micropyle remains as a small pore in the seed coat of a seed.

    (iv) integuments of an ovule harden and the water content is highly reduced, as the seed matures.

    (v) apple and cashew are not called true fruits.   5

OR

(a) Draw a labelled diagram of L.S. of an embryo of grass (any six labels).

(b) Give reason for each of the following:

    (i) Anthers of angiosperm flowers are described as dithecous.

    (ii) Hybrid seeds have to be produced year after year.

RklF<?I R:g(j if; fcltiGr -q CWJT ~   :

(i)   ~Wtdiiflf~ljl -q ~   1'Ji·NI ~   ~   ~   ~   ~ \ifGi ~   ~
      ~   q,1 ~   lll"?IT GR ~   mm ~ I

(ii) ijll/)~   if; ~   Q~fiFi~" 02IT 31ts if; ~.   Q~f~"¥l ~   ~

(iii) ~   if; ~-~   (41\illCl{OI) -q ~   t~+ ~\iI,o:$s;H   CfiTlllf GAT ~   ~

(iv) ~-~   ~   qRqCfq mm ~   ~ ~-~   cql\ilI0:S if; 3WRUT ~   ~   ~   ~
      ~   -;jffi q,1 lll"?IT ~   qjtf m ~   ~ ,

(v)   ~   02IT ~   q;) Cll~FqC6   "Cfi"R ~   ~   ~

                    ~

(a)   ~   ~   ~   ~   ~ ~.S. qjf 'w4ifctid ~   ~   (~   W:" '"11l4iCfi'"4)

(b)   f.lk1fi1 f@d -ij "it ~   qjf CfiRUT ~   :

   (i)   3i1~d~IM4i ~ ~   ~ q<lJlq1)~n -q))- F~qlF~Cfi CNM ~   ~ I

   (ii)   ~~-q))-~~~~~~mor~   I

29. Describe the mechanism of pattern of inheritance of ABO blood groups
     in humans.   5

<div align="center">

OR

</div>

(a)   Why is haemophilia generally observed in human males ?
      Explain the conditions under which a human female can be
      haemophilic.

(b)   A pregnant human female was advised to undergo M.T.P. It was
      diagnosed by her doctor that the foetus she is carrying has
      developed from a zygote formed by an XX-egg fertilized by
      Y-carrying sperm. Why was she advised to undergo M.T.P. ?

(a)   ~J{l!t)fi1l1l fllJ""flO<ld: 'J""fRCf ""liT -ij m ~   mor ~   ~   ~ ? ~   t:fl41!hlf(?llll
       M 'J""fRCf 1""fl'GT -ij m- m3lf -ij an ~   ~, flJ""$i l$ll> I

(b)   ~   ~   ~.   -q))-WfIfur qjf f~fctiffi)ll m (M.T.P.) m ctt ~   <ft
       rTGfi I ~~~~-ijWiT   2TTfcfi~~~~-ij1R1~~~
       ~   jJJ""f"1'J4it ~   ~an ~ "Jll Y-~   ~   ~ f-"l~f:qd SQ: XX-~   "it
       ~   ~ I ~ ~   -q))-M.T.P. m ctt ~   ~ <ft lf{ ?

W. (i) Describe the characteristics a cloning vector must possess ..

(ii) Why DNA cannot pass through the cell membrane ? Explain. How is a bacterial cell made 'competent' to take up recombinant DNA from the medium?   5

OR

If a desired gene is identified in an organism for some experiments, explain the process of the following :

(i) Cutting this desired gene at specific location

(ii)~thesis   of multiple copies of this desired gene

(i)   fcnm CR1l~q;ltl ~   if cp;rr-cp;rr ~~ledl~   iRt ~,   quf;f ~

(ii)   ~   ~   ~ fc6 DNA <i)~Iq;1 ~   if ~ ~   ~   ~   ~   ? flJi$ll~~   I
        fcnm ~   chl~Iq;1 cit ~   if ~ ~~l(Nj41 DNA cit :Wrr ~   ~   ~ ~
        ~   ~   '~'   GAT 1W:rr \ifTOT ~   ?

~   ~   wrrtTl ~ fcnm ~   if ~   qffi.rn ~   ~   fWu IfllT ~ m r"1k1r~r&d
~an   ~ ~   if flJi$ll~~   :

(i)   ~   ~   "tR qffi.rn ~   ~ q;m ~

(ii)   ~ qffi.rn ~   q,1 ~   5Irdr~Flp-'tl qjf <8~c')|5|0| ~