

Series: SSO/1

Code No. **57/1/1**
m-r.

Roll No. | | | | | | | |
'm"f 'l.
, .

Candidates must write the Code on

fcm"MT ~ ~ ~ IR m-;t.
the title page of the answer-book.

1f9

~ft;;@ |

- Please check that this question paper contains 12 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 student will read the question paper only and will not write any answer on the answer script during this period.
- ~CR"Rfq;Ww-1"li;f~~12~ |
- w-1-"li;f ~ ~ ~ cn131Tr ~ ~. 'p:<SJrqT ~ "3W~~ ~ 1f9~~IR ft;;@ |
- ~ ~ CR"Rfq; w-1-"li;f ~ 30 w-1 ~ |
- ~CfiT"3'ffi"~~~~«~~CfiT~~~ |
- Ww-1-"li;fCfiT~~~ 15fJ:r:R:Cf)f~~TT<nt- | w-1-"li;fCf)f~~~ 10.15 ~ ~
~ | 10.15~~ 10.30~(1Cfi~~w-1-"li;fCfiT~~w-31Cifu~~~"3W~~
IR CfiTt"3W~ Wr@T |

BIOLOGY (Theory)

~ fct~l~ (~oalR1C6)

Time allowed: 3 hours J

{ Maximum marks: 70

Rwfmr WF! : 3 "EfTlt]

[~3fcfi: 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.
- (iv) Wherever necessary, the diagrams drawn should be neat and properly labelled.

- (i) ?nftJrFf~t I
- (ii) W JrFf-TT;f if ~ ~ A, B, C 3#< D! I ~ A if 8 JrFf t PRif ~ * CfiT ~ 3fcf;t, .
 ~ B if 10 JrFf t PRif ~ Cfi ~ 3fcf; #, ~ C if 9 JrFf t PRif ~ rfr 3fcf; t nm
 ~ D if 3 JrFf t PRif ~ * r:ikr 3fcf; t I
- (iii) C# w:n:r "fFR~ (aWR-3fk;r Ww) ~;:rtf t I fti< ~ 2 aicf;f Cfi(Y{ ~ JrFf if, 3 aicf;f
 Cfi(Y{ ~ JrFf if 3#< 5 aicf;f m ?/ft rft;rT m if ~ "fFR~ ~ Tjr t I # m if
 Fcmmf CfiT cf;c{fr ~ it ~ CfiT ~ ~ t I
- (iv) iifff '4T 31/CiNCfJ et. ~ ~ Cfi(Y{ ~ mg;~ nm ~"fiIC{ if '174iM('f if I

SECTION-A

~-A

1. Why hnRNA is required to undergo splicing? 1

hnRNA c0T {411~fBjl (~) ~~~cp:IT""PfRT~~?

2. The microscopic pollen grains of the past are obtained as fossils. Mention the characteristic of the pollen grains that makes it happen. 1

~ CfmYf ~ ~ IRfTT cfiUT "11C!!~t{i ~ ~ ~ >ftt(f ~ ~ I~ IRfTT q;uIT cpl CfiI' CFIT fCl~tll d I
 ~~~~~~?

3. How does colostrum provide initial protection against diseases to new born infants? Give one reason. 1

Cf)l('lk;4 ('1C!«1;:q) mt ~~~ ~ fmI coT M ~ ~ ~ ~ fcp~nrCfiR~ mctT ~ ?  
 ~C11RUT~ I

4. Crustaceans

--I---T~ Other animal groups

Name the unlabelled areas 'a' and 'b' of the pie chart (given above) representing the global biodiversity of invertebrates showing their proportionate number of species of major taxa.

1

## Crustaceans

b

~~\;{f~~W.q~ 3iCfi~'lC\fcfictit~~.q~ ~~~flGj (1'1"1fcclli)cit  
3i'iqjf<'tCfi ~~~TT<fit 6"f'114ifCfl(i~ "a" (fit "b" CFITt ~~ I

5. Mention the type of evolution that has brought the similarity as seen in potato tuber and sweet potato. 1

3m1 c);,cfjq (fit ~lCfi<cf;e,q WiT ~ crffi «4H(i1 ~ c); ~ ~ ~ m ,awft~, ~  
~l

6. Name the group of organisms and the substrate they act on to produce biogas. 1

"3'1' ~ c);qrf 'CfiT~ nm~ ~ 'CfiT~ ~ Pm tR fWc:tt CRCf; <t \iller at41~« GRffi' ~ I  
•

7. Mention the pollinating agent of an inflorescence of small dull coloured flowers with well exposed stamens and large feathery stigma. Give any one characteristic of pollen grains produced by such flowers. 1

~~~c); q<1l101CfiRth 'l:R'CfiT~~~'tfR-mz .amm'Mmm~~  
~"CfiT W ~~~ ~ (fit ~-m ~ ClmCfil!:m I ~ ~.q ffi m tmTT ~
citm~fCl~l~(i1 ~ I

8. Name the organism commercially used for the production of single cell protein. 1

~ Cfl)~lCfilmtR c); 6qlqIRCfi «'R 'tR ~ c); fu"ct ~ .q ~ ~ m \iller 'CfiT~
~l

SECTION-B

~~B

9. Explain the contribution of *Thermus aquaticus* in the amplification of a gene of interest. 2

10.

- (i) What does the above diagram illustrate?
 (ii) Name the parts labelled 'a' and 'b'.
 (iii) Name the type of cells that produce this molecule.

2

b

a

- (i) "3N{ ~ ~ 3lfhg -q~ ~~ Tk<it" ~ ?
 (ii) "a" ~ "b" 'lltii~(l ~ cfl;w:r ~ I
 (iii) ~ a:roj em"GR"R ~ CfIf:<ICfil~ CfiT;w:f I

11. Banana is a parthenocarpic fruit whereas oranges show polyembryony. How are they different from each other with respect to seeds?

2

OR

Where are fimbriae present in a human female reproductive system ? Give their function.

cl;m~ ~f"1~Cflq;<1.n "lfiRt~mm-q~.M"lWft~~ | ~fcl;ftcfl~-q
 cf ~ \varnothing ~f;~nrCf)R"R ~ ~?

~ attTelT
 100 ltrCi cfl\;f'1"1'-'fflq~ (~) ~ "IR ~ 'lWT ~ ~ ~ t? ~ m ~ I

12. How is the translation of mRNA terminated? Explain.

2

mRNA cfl~i'ti(¥)~H (~) m CfiT ~ f~;~nrCf)TMM t ? 'iti\$ll~tt I

13. Explain accelerated eutrophication. Mention any two consequences of this phenomenon. 2

~ ,lj(;;Hj4lt:ioI (<tS:;lN;\$l'H) ~mmort? ~Jl\$II~Q I~ QREI6'I1 ~~~crrRq;f{<:J
~~I

14. List the specific symptoms of amoebiasis. Name the causative organism. 2

3I¥0ftfa1Qf~Hi (~) **mcfi** ~m:JUTCf<IT-Cf<ITt, ~ I~ 3«l'''ICf1HI ~q;r
-;wr~ I

15. A crane had DDT level as 5 ppm in its body. What would happen to the population of such birds? Explain giving reasons. 2

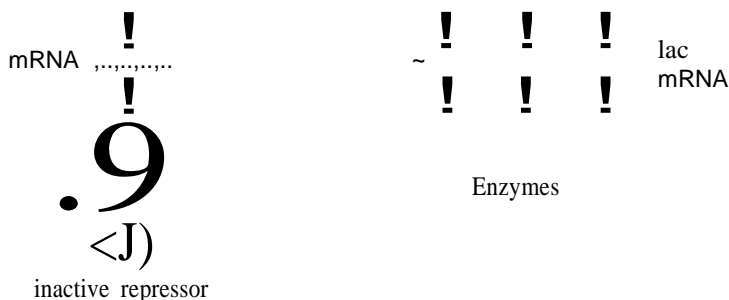
'QCflmm cfimR IIDDt q;r mt 5 ppm ~ I~ ~ qft~ ~ Cf<IT~ ? .Cf1T~PffTrrf~
~Jl\$II~Q I

16. Describe the responsibility of GEAC, set up by the Indian Government. 2

'qf«f mcf;R" S:m ~ GEAC qft Cf<IT~ flijx4~IRl(i t cruR ~ I

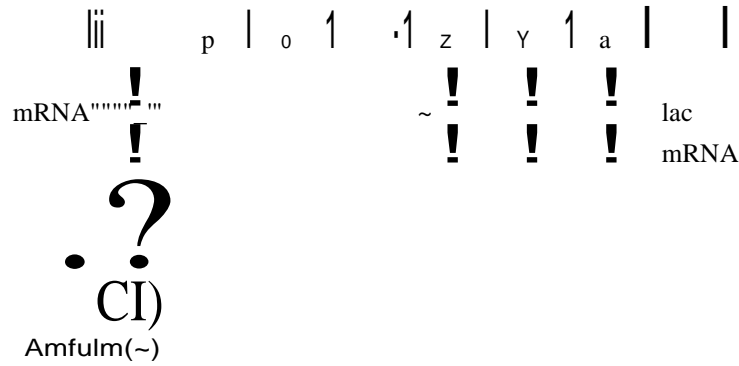
17. During the secondary treatment of the primary effluent how does the significant decrease in BOD occur? 2

18. Study the figure given below and answer the questions: 2



- How does the repressor molecule get inactivated?
- When does the transcription of lac mRNA stop?
- Name the enzyme transcribed by the gene 'Z'.

~~\7fTW ~CR ~:am 3WT~\7fTWmcf;"3W~:



- (a) fufw -31U f~;~nrcm~ M \7fTff t ?
- (b) lac mRN A CR~i f~L?H (31 'i~liiH) C)tf QCFi \7fTff t ?
- (c) ~ 'z' IDU ~i«iSfiI~CSf ~m~CR";ffl1~ I

SECTION-C

~-C

19. Name the pioneer species on a bare rock. How do they help in establishing the next type of vegetation ? Mention the type of climax community that will ultimately get established.

3

==I' ~ 'q\ ~ e,m;ft ~(j)l4')Wl~n"1(tl"1if(i41) cf;" ;ffl1~ I~ ~ m qft Cif+f4fo
 ~~l1~~~~t? ~~~cf;~CR";ffl1~\ifT~:
 m~1

20. Study the figure given below and answer the questions that follow:

- (a) Name the stage of human embryo the figure represents.
- (b) Identify 'a' in the figure and mention its function.
- (c) Mention the fate of the inner cell mass after implantation in the uterus.
- (d) Where are the stem cells located in this embryo?

3

- (a) m.r ~fc'l<;~1(1llm ~qft ~q;r';f[tl'~ I
- (b) m.r 'a' 114ifCfl(1~q;r';f[tl'~ 31tt~m~ I
- (c) ~~~~(1{1~(1m\1fR~~~Cf)l~l':hl~q;r~mm~?~ I
- (d) ~~,r~ (~) Cf)l~ICf)IQ~~?

21. Give the scientific name of the parasite that causes malignant malaria in humans. At what stage does this parasite enter the human body? Trace its life cycle in human body. 3

~ .r ~ 4MR41 ~ ~ ~ ~ q;r ~IRCf) 'f[tl' ~ 1 ~ ~ llm mtt .r
:am~ ~ IR m Cf)«iT ~? llm mtt.r ~ cttR ~~~ q;r quf., ~ 1

22. Draw a labelled schematic sketch of replication fork of DNA. Explain the role of the enzymes involved in DNA replication. 3

DNA Cfft ~rc'11if('1~ q;r ~ 114ifCfl(1~ ~ ~ 1DNA ~f(11ifc'1.r ~ Cfft
~tl4\$tI~Q 1

23. Explain the causes of global warming. Why is it a warning to mankind? 3

~ dl64141 ~~~~~'CJi'R'UT~? tl4\$l1~Q 1411cl(1i ~~~~ ~(11C4;ft~~?

24. Haemophilia is a sex linked recessive disorder of humans. The pedigree chart given below shows the inheritance of haemophilia in one family. Study the pattern of inheritance and answer the questions given.

2

3 4 5 6 7 8 9

10 11 12 13 14 15

- (a) Give all the possible genotypes of the members 4,5 and 6 in the pedigree chart.
- (b) A blood test shows that the individual 14 is a carrier of haemophilia. The member numbered 15 has recently married the member numbered 14. What is the probability that their first child will be a haemophilic male?

3

OR

Inheritance pattern of ABO blood groups in humans shows dominance, codominance and multiple allelism. Explain each concept with the help of blood group genotypes.

thil&R1(Oll~"4~fWr~~~~~ 1~~~~~IIC4MI~"4~~
 "4f_;lxi1fthf<"14ft~~IIIfcl ~Tflfi'~ I~ ~~~IIIRt~q;r m~ ~ 3WT
 ~~~m~~~1

3 4 5 6 7 8 9

- (a) ~~~10C4e;ftm 4,5 (fllT 6 ri~ 12;ffi"l~~q 13 14 15  
 (b) ~~~-qm"qffifc~mr 14 i)xilfChfC14q;r~~ I~mr 15 -;t~  
 mll~mr 14 ~f;q;<rr~ I~fq;~~~qft~41{g;f(14IIH{i;:rr  
 m-fqft~ ~Ifllcfl(11M?  
 ~II ABO ~W:~ ~~(Jl(fo ~"4~, ~~(nIT iilsfqCfi~('1( M"Q1<fr~  
 ~ I~ ~ ;ffi"l~\C)41 ~ ~ ~ ~ {jCfi~'1( Cft fliti)Cfi{OI ~ I

25.

Tasmanian wolf

Sugar glider

Koala

Banded anteater

~"J~  
 ~  
 b~

Wombat

Kangaroo

- (a) Mention the specific geographical region where these organisms are found.
- (b) Name and explain the phenomenon that has resulted in the evolution of such diverse species in the region.
- (c) Explain giving reasons the existence of placental wolf and Tasmanian wolf sharing the same habitat,

3

Tasmanian wolf

Koala

- (a)
- (b) ~ QREI2'=tq;r 'fllf ~ ~ '(ilOI\$il~Q~ QRolilOlfCl~Q~ ~ I) W=ft ~ Wl:(nG;!  
q;r fcrcl;m "[-3Tt I
- (c) tJl:820H (-w:ro) ~-ctfl"tlf"l41 ~q;r~~~trQ4lc:tm (~)-q~~~  
~m~"[-3TI, Cf)RUf~~\$Q'(ilOI\$il~Q I

26.

PvuI

Pst I

-SaII

PvuII

- (a) Identify the selectable markers in the diagram of E. coli vector shown above.

- (b) How is the coding sequence of α-galactosidase considered a better marker than the ones identified by you in the diagram? Explain.

3

b Cla I

Pst!

-SalI

PvuII

(a) "3m ~ ~ E. coli c); ~ (~) c); ~ ~ 'q 400f41 III ~ (fq~Cf)l) CfIT  
qil\q lP:ll?> I

(b) ~ ~ ~ mT ~ ~ ~ qft,a:rq~ a-I~JlCf2.1f<8,g;;CfiT~ ~"Cf41 ~  
l1RT ~ **t** ? :g4\$!1~\?> I

27. Construct an ideal pyramid of energy when 1,000,000 joules of sunlight is available. Label all its trophic levels.

3

~t):m~~fq<lf4'5~~ 1,000,000~~CfiT~mt<immm I ~~  
~ «i'U CfiT00f14icfH ~ I

## . SECTION-D

--D'

28. Explain with the help of a diagram the development of a mature embryo sac from a megaspore mother cell in angiosperm.

5

OR

Study the following flow chart. Name the hormones involved at each stage. Explain their functions.

Hypothalamus

"-

Pituitary

"-

Testes

"-

Sperms

Qf-i1~)'(44(~(141\111)"#~ 11'6afi\11(U)fiQ ChmlChI ~~-qftqqq '{UT~~GRffi~~ ~  
<iT~~ fl14\$iI\$Q I

~(~~)

j,

fqqC:~l(~~)

j,

~

j,

~

29. (a) Explain the experiment performed by Griffith on *Streptococcus pneumoniae*. What did he conclude from this experiment?
- (b) Name the three scientists who followed up Griffith's experiments.
- (c) What did they conclude and how?

5

OR

Two blood samples A and B picked up from the crime scene were handed over to the forensic department for genetic fingerprinting. Describe how the technique of genetic fingerprinting is carried out. How will it be confirmed whether the samples belonged to the same individual or to two different individuals?

- (a) ~ rm ~Q.1Chl%fl ~"tIT ~ Tk:IT WWT fl14\$iI\$Q I W m~m~ ~ ~?
- (b) &1cfR ~IRChl ~ 1111~ ~ fuftl1~p~WT ~ 3WT ~ ~ 3ltt m~ I
- (c) ~ ~ ~ ~ -3ltt fcR1 >fCfiR ?

fcR:ft ~ ~ ~ ~ m ~ ~tcRf ~ A -3ltt B Cfin~Ch (o:<:lllllH41 V'ffq) ~ 'ChT  
3ilicir<ICh fY;ll{f~R)l ~ m mq ~ I 3iliciP<ICh fY;ll<mRII cit (lCh.jjCh fcRl >fCfiR cit VifRft ~  
quf; ~ I ~ ~ m \*lf~w;q(l ~ "IIT ~ fq;<t ~ ~ M oqfiffi ~ ~ "IIT ql \*i'T-  
\*i'T 04fCffi41 ~?

30. One of the main objectives of biotechnology is to minimize the use of insecticides on cultivated crops. Explain with the help of a suitable example how insect resistant crops have been developed using techniques of biotechnology.

5

OR

- How is mature insulin different from proinsulin secreted by pancreas in humans?
- Explain how was human functional insulin produced using rDNA technology.
- Why is the functional insulin thus produced considered better than the ones used earlier by diabetic patients?

~ SI~ilpICfl')CfIT ~ ~ ~ ~ fcl ~ ~ 1R CfI')61If~IIII CfIT CfII ~ CfII ~ fcf;<rr  
 \ifT<t I ~ ~ d<;l\$OI ~ ~ tll1\$II~ fcl ~ SIWPICFII CfII dCf);fCfII CfIT ~ ~ ~ "CfIIz-  
 ~~~~fqCf)ffld cit~~?

~

- liRCIT# 4f~41"J (.a:tj"4I~14)~..m~ijf<l'l'1 ~~~~~N;qM'~?
- rDNA mWPICfII CfIT ~«111lfl ~ ~ lIRCf Cf)p·hnifl ~ ~ ~ ~ TFft ?
 tll1\$II~({ I
- W ~ ~ CfII TT<t Cf)1~l{nifl ~ CfIT ~ ~ ~ W<r<rr rnr ~«1111<'CfII ~ 'C'Tffii
 ~ ~ CFIT ~ EJRT \fTdT ~ ?