ATKT Exam, Sem-III

SYBA/SYBCom/SYBSC

March-2024

SYBSC B.T

ATKT Exam

Sem III

March-2024

III

SYBA / Bcom / BSc

Sub: Foundation Course

Time – 2 ½ hrs. Total Marks – 75

N.B. 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Q.1) A) Explain the following concepts. (Any five) 15

1) Schedules castes.
2) Right against Exploitation.
3) Human rights of person with disabilities.
4) Disaster.
5) Classical era.
6) Prejudices
7) Self-awareness
8) Group Discussion

OR

B) Discuss in detail on the Foundation Course (semester –III) project submitted by you. 15

Q.2) A) In what ways do the human rights of women violate?

OR

B) Explain the Fundamental Rights of Indian citizens.

Q.3) A) Explain the Economic and Social effects of disasters. 15

OR

B) Discuss in detail the flood of Maharashtra in 2005.

Q.4) A) State the contribution of any four scientists towards the growth of science during the period of the 'Renaissance'. 15

OR

B) State the importance of technology in the modern era.

Q.5) A) Discuss the Advantages and Disadvantages of written communication. 15

OR

B) Comment on 'Team Building' and 'Effective Listening;

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मराठी रुपांतर

एकूण गुण - ७५ वेळ - २ तास ३० मिनिटे

सूचना - १) सर्व प्रश्न अनिवार्य आहेत.

२) उजवीकडील अंक पूर्ण गुण दर्शवितात.

प्र.१) अ) खालील संकलपना स्पष्ट करा. (कोणत्याही पाच) १५

१) अनुसूचित जाती

२) शोषणा विरुद्धचा हक्क

३) अपंग व्यक्तिचा मानवी हक्क

४) आपत्ती

५) पारंपरिक कालखंड

६) पूर्वगृह

७) स्वयं जाणीव

८) गट चर्चा

किंवा

ब) पायाभूत अभ्यासक्रम (सत्र - ३) साठी तुम्ही सादर केलेल्या प्रकल्पावर सविस्तर चर्चा करा.

प्र.२) अ) महिलांच्या मानवी हक्कांचे उल्लंघन कशा प्रकारे केले जाते ते सांगा. १५

किंवा

ब) भारतीय नागरिकांचे मूलभूत अधिकार स्पष्ट करा.

प्र.३) अ) आपत्तीचे आर्थिक आणि सामाजिक परिणाम विशद करा. १५

किंवा

ब) सन २००५ सालच्या महाराष्ट्रातील महापुरावर सविस्तर चर्चा करा.

प्र.४) अ) पुनरुजीवन कालखंडातील कोणत्याही चार शास्त्रज्ञांचे विज्ञानाच्या विकासातील योगदान सांगा. १५

किंवा

ब) आधुनिक काळातील तंत्रज्ञानाचे महत्त्व सांगा.

प्र.५) अ) लेखी संज्ञापनाचे फायदे व तोटे यावर चर्चा करा. १५

किंवा

ब) 'संघ बांधणी' आणि 'प्रभावी श्रवण' यांवर भाष्य करा.

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D.B.J. College Chiplun
ATKT Exam March 2024
Sem III
SY (Bio Tech)

SY B.T
2/3/24

Time – 2 ½ hours Sub: Bioprocess Technology Marks–75

Note: Attempt **all** questions.
All questions carry **equal** marks.
For **Q.2, Q.3 and Q.4** attempt A and B **OR** C and D
Draw **neat labeled diagrams** wherever necessary.

Q.1 **A)** **Answer the following. (Any fifteen)** **(15)**

1. Define master culture.
2. Which are the physical parameters essential for production media?
3. Give any two criteria essential for culture used as inoculum.
4. Write any two basic function of fermenters.
5. Define sterilization.
6. Give any two examples of nitrogen sources used in fermentation media.
7. Enlist any two types of spargers.
8. Define in-line sensor.
9. Give one application of rotameter.
10. Write any two types of pumps used for liquid flow measurement.
11. Define piezoelectric effect.
12. Enlist the any two types of antifoam devices.
13. What is pitching?
14. Define brewing.
15. Give an example of amylase producing fungi.
16. Give the role of metalloproteases.
17. What is the temperature of solid substrate in citric acid production?
18. Write any one advantage of aerobic fermentation.
19. Define homo-fermentation.
20. Name any two strains used in penicillin production.

Q.2 **A)** Explain the structure and function of Air-lift fermenter. **(08)**

Q.2 **B)** Elaborate on the types and properties of antifoam. **(07)**

OR

Q.2 **C)** Describe the factors affecting choice of carbon sources. **(08)**

Q.2 **D)** Explain the process of media sterilization in batch fermenters. **(07)**

Q.3 **A)** Explain in detail temperature control and measurement in fermentation process. **(08)**

Q.3 **B)** Elaborate on the scale-up of batch sterilization processes. **(07)**

OR

Q.3 **C)** Describe the bacterial inoculum development in detail. **(08)**

Q.3 **D)** Discuss on the main classes and application for process control in fermentation. **(07)**

Q.4 A) Explain the role of microorganisms in vaccine production. (08)

Q.4 B) Describe the significance and application of batch and continuous fermentation. (07)

OR

Q.4 C) Elaborate on the steps involve in penicillin production. (08)

Q.4 D) Explain the ethanol production from microorganisms in detail. (07)

Q.5 **Write short notes on any three of the following.** (15)

a. Acetator and cavitator
b. Rheology
c. Flow measurement of gases
d. Acid hydrolysis
e. Saccharification

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D.B.J. College Chiplun
AT KT Exam March 2024
Sem III
SyBSc. (Bio Tech)
Sub: Medical Microbiology

SYBSC B.T
26/3/24

Time -2.30 hours
Note: Attempt **all** questions. **Marks–75**
All questions carry **equal** marks.
For **Q.2.Q.3 and Q.4** attempt A and B **OR** C and D
Draw **neat labeled diagrams** wherever necessary.

Q.1 A) Do as directed. (Any fifteen) **(15)**

1. The disease causing agent is called ----------.
2. Write examples of microbiota in mouth.
3. Define viremia.
4. The hepatitis B is transmitted through indirect contact transmission.(State true or false)
5. The Anthrax disease is caused by ----------.
6. Define chronic disease.
7. Write the examples of opportunistic pathogen.
8. The *S.pneumoniae* is a gram-positive bacteria.(State true or false)
9. Write the name of toxins synthesized by *E.coli*.
10. Enlist the test used for diagnosis of tuberculosis.
11. Write the name of sample collected for diagnosis of *S.aureus* infection.
12. Define furncle.
13. Write the two antibiotics used in treatment of S.pyogenes.
14. What is the EPEC?
15. Give the name of bacteria which produces blue pus.
16. Define pan resistance.
17. The incubation period for *Salmonellaspp.* is usually ----------days.
18. Write any two modes of transmission of *Shigellaspp.*
19. Give an example of exotoxin produced by bacteria.
20. Which is the causative agent of Syphilis?

Q.2	A)	Describe the stages in development of the disease.	(08)
Q.2	B)	Give an account on normal flora of Skin ,mouth and respiratory tract.	(07)
		OR	
Q.2	C)	Describe the Descriptive Epidemiology.	(08)
Q.2	D)	Explain the mechanism of transmission of diseases.	(07)
Q.3	A)	Give an account on lab diagnosis and management of tuberculosis.	(08)
Q.3	B)	Describe the clinical diseases of *E.coli*	(07)
		OR	
Q.3	C)	Explain the Immuno and chemoprophylaxis for tuberculosis	(08)
Q.3	D)	Describe characteristics of *S.pyogenes.*	(07)
Q.4	A)	Give an account on the cultural characteristics of *Pseudomonas spp.*	(08)
Q.4	B)	Explain the stages of disease progression of syphilis	(07)
		OR	
Q.4	C)	Give an account onthe epidemiology of bacillary dysentery.	(08)
Q.4	D)	Elaborate on prophylaxis of Salmonella infections.	(07)
Q.5		**Write short notes on any three of the following.**	(15)
	a.	Enlist characteristics of *S.aureus*	
	b.	Prevention and control of pneumococcal infection.	
	c.	MDR and DOTS	
	d.	Three types of toxic activity demonstrated by Shigella.	
	e.	Laboratory diagnosis of Gonorrhea disease.	

D.B.J. College Chiplun
ATKT Exam March 2024
SyBSc. (Bio Tech.)
Sub: Applied Chemistry

SYBSC B7
5/3/24

Time – 2 ½ hours | Marks–75

Note: Attempt **all** questions.
All questions carry **equal** marks.
For **Q.2,Q.3 and Q.4** attempt A and B **OR** C and D

Q.1 **A) Attempt any fifteen of the following.** **(15)**

1. Give biological role of peroxidase.
2. What is a co-factor?
3. State true or false.
   Porphyrin ring in myoglobin molecule have Mg as their central atom.
4. What is addition reaction?
5. Give significance of transferase enzyme.
6. Define enzyme.
7. Fill in the blank.
   ---------- type enzymes catalyzing the synthetic reactions where two molecules are joined together and ATP is used.
8. Which centrifugation depends on buoyant densities?
9. Fill in the blank.
   ---------- centrifugation is used to separate certain organelles from whole cell.
10. What are the different types of rotors used in a centrifuge?
11. Define void volume.
12. Give the role of spacer arm.
13. Fill in the blank.
    ---------- chromatography is used to separate biological macromolecule based on their specific interaction with stationary phase.
14. Give an example of cation exchange resin in ion exchange chromatography.
15. Enlist names of supporting matrix in electrophoresis.
16. State the role of urea in PAGE separation of DNA.
17. Fill in the blank.
    The use of low ionic strength in electrophoresis ---------- the rate of migration of proteins.
18. Give names of tracking dye used in SDS-PAGE of protein.
19. What is the role of poly acrylamide in gel electrophoresis?
20. Define electrophoretic mobility.

Q.2 **A)** What is elimination reaction? What are the various mechanisms of elimination? **(08)**

Q.2 **B)** Explain in detail biological role of calcium and phosphorus. **(07)**

OR

Q.2 **C)** Explain example of metal complexes used in medicines. **(08)**

Q.2 **D)** Describe in brief classification of enzymes. **(07)**

Q.3 A) Explain principle and working of molecular exclusion chromatography. (08)

Q.3 B) Discuss rate-zonal centrifugationin brief. (07)

OR

Q.3 C) Explain ligand selection and attachment in affinity chromatography. (08)

Q.3 D) Explain differential centrifugation in detail. (07)

Q.4 A) Discuss in brief staining and detection methods in electrophoresis. (08)

Q.4 B) Explain in detail zone electrophoresis. (07)

OR

Q.4 C) Discuss iso-electric focusing electrophoresis in detail. (08)

Q.4 D) Explain the paper electrophoresis in detail. (07)

Q.5 **Write short notes on any three of the following.** (15)

a. Peroxidases
b. Compare betweenSN^1 and SN^2reaction.
c. Basic principle of sedimentation.
d. Principle of ion exchange chromatography
e. Applications of electrophoresis

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SYBSC BT
6/3/24

D.B.J. College Chiplun
ATKT Exam March 2024
Sem III
SYBSc. (Bio Tech)
Sub: Fundamentals of Biophysics

Time – 2 1/2 hours Marks–75

Note: Attempt all questions.
All questions carry equal marks.
Under Q.2,Q.3 and Q.4 attempt A and B OR C and D.

Q.1 **A) Attempt any fifteen of the following.** **(15)**

1. Define the term refraction of light.
2. Fill in the blank.
   Two waves maintain a constant phase difference over a long distance and time are called ----------waves.
3. State true or false.
   YAG (Yttrium aluminium garnet) is an example of chemical type LASER.
4. Enlist components of LASER.
5. Which component generates a beam of electrons in the electron gun of TEM?
6. Give an application of electron microscopy.
7. What is interference?
8. Give applications of surface tension.
9. What is biomagnetism?
10. Give an example of ferromagnetism.
11. Define surface tension.
12. What is the unit for measuring frequency of sound?
13. Enlist different factors that affect viscosity of the fluid.
14. Give the temperature measuring method.
15. What is spectrum?
16. Give any two structural factors which give rise to fluorescence.
17. What is chemiluminescene?
18. Write any two detectors used in spectrophotometer.
19. Give advantages of luminometry.
20. Give the difference between spectrophotometer and spectrofluorimeter.

Q.2 **A)** Explain in detail principle and construction of SEM. **(08)**

Q.2 **B)** Discuss properties and application of LASER. **(07)**

OR

Q.2 **C)** Elaborate on immune-electron microscopy. **(08)**

Q.2 **D)** Describe dispersion of light in detail. **(07)**

Q.3 **A)** Explain the principle, construction, working and use of an Ostwald's viscometer. **(08)**

Q.3 **B)** Differentiate between diamagnetism and paramagnetism. **(07)**

OR

Q.3 C) Explain the principle, construction and working of platinum resistance electrode.

Q.3 D) Define surface tension and add a note on angle of contact.

Q.4 A) Discuss the principle and application of fluroscence spectroscopy.

Q.4 B) Explain the principle and instrumentation in light scattering spectroscopy.

OR

Q.4 C) Explain basic laws of light absorption in detail.

Q.4 D) Discuss the principle and working of IR spectroscopy.

Q.5 **Write short notes on any three of the following.**

a. Construction of fluorescence microscopy
b. Spontaneous emission
c. Capillary action of liquid
d. Types of sound waves
e. Application of luminometry

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D.B.J. College Chiplun
ATKT Exam March 2024
Sem III
SYBSc (Bio Tech.)
Sub: Immunology

SYBSc BT
7/3/24

Time – 2 ½ hours Marks–75

Note: Attempt **all** questions.
All questions carry **equal** marks.
Under **Q.2,Q.3 and Q.4** attempt A and B **OR** C and D
Draw **neat labelled diagrams** wherever necessary.

Q.1 A) Attempt any fifteen of the following. (15)

1. Define anaphylatoxins.
2. The C_5b is initial component of MAC synthesis (State True/False).
3. ----------complement component is involved in immune clearance.
4. What is the function of C_3 convertase?
5. Enlist the complement components involved in the alternate pathway of complement activation.
6. ---------is the site of B cell maturation in humans.
7. ITAM is present in transmembrane region of T cell and have an antigen binding specificity. (State True/ False).
8. Hereditary angioedema is caused by the deficiency of ----------
9. Which are the pathways of complement component activation?
10. ----------co-receptor is present on the T helper cell membrane.
11. State true or false: MHC class II is seen on the surface of all nucleated cells.
12. Give examples of antigen presenting cells.
13. ---------- domains form the antigen binding cleft in MHC class I molecule.
14. What is endogenous antigen?
15. What is the function of proteasome?
16. Define immunoprecipitation.
17. Give one application of Coomb's test.
18. State true or false:Enzyme-linked immunosorbent assay (ELISA) is similar in principle to RIA but dependson an enzyme rather than a radioactive label.
19. Give an example of fluorochrome used to tag antibodies.
20. What is luxogenic substrate? Give one example.

Q.2 A) Describe the structure and function of Thymus. **(08)**

Q.2 B) Describe the classical pathway of complement activation. **(07)**

OR

Q.2 C) What is haematopoiesis? Diagrammatically represent the process. **(08)**

Q.2 D) Explain the effects of complement deficiencies. **(07)**

Q.3 A) Discuss the steps involved in T cell activation. **(08)**

Q.3 B) Explain the cytosolic pathway of antigen presentation. **(07)**

OR

Q.3 C) Describe the structure of B cell receptor. **(08)**

Q.3 D) Give diagrammatic representation of synthesis, assembly and secretion of Immunoglobulin. (07)

Q.4 A) Describe the technique of immunoelectrophoresis. (08)

Q.4 B) Elaborate the Western blotting technique. (07)

OR

Q.4 C) Explain the steps involved in Chemiluminescnce method. (08)

Q.4 D) Describe the principle and procedure of RIA. (07)

Q.5 **Write short notes on any three of the following.** (15)

a. B lymphocytes.
b. Regulation of complement system
c. MHC class I molecule.
d. Structure and function of TAP protein
e. ELISPOT assay.

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SYBSc-B.T
9/3/24

D.B.J. College, Chiplun
ATKT Exam March 2024
SY B.Sc. (Bio Tech)
Sem III
Sub: Molecular Biology

Time – 2 ½ hours **Marks–75**

Note: Attempt **all** questions.
All questions carry **equal** marks.
Under **Q.2.Q.3 and Q.4** attempt A and B **OR** C and D
Draw **neat labelled diagrams** wherever necessary.

Q.1 A) Answer the following (any fifteen). **(15)**

1. What is splicing in transcription?
2. Hemoglobin is made up of how many subunits?
3. Define Exon.
4. snRNPs stands for _____.
5. Give function of Rho factor in prokaryotic transcription.
6. CAAT box present in eukaryotes.(State true or false)
7. Define RNA editing.
8. What is charged t-RNA?
9. Name the start codon of eukaryotes.
10. When glucose is in the medium along with lactose, the glucose is used preferentially because catabolite repression occurs. (State true or false)
11. Write the name of the three stop codons.
12. State role of TATA box.
13. Name the enzyme encoded by lac A gene
14. State the function role of beta galactosidase enzyme.
15. Define polysome.
16. Name the three RNA's involved in translation.
17. Which enzyme is involved in the formation of peptide bond between two amino acids in translation.
18. Define translation.
19. Number of structural genes present is the trp operon is _____.
20. Give role of lac repressor.

Q.2 A) Discuss in brief termination process of prokaryotic transcription. **(08)**

Q.2 B) Distinguish between prokaryotic and eukaryotic promoter. **(07)**

OR

Q.2 C) How transcription initiation complex is synthesized in eukaryotes? Explain in detail. **(08)**

Q.2 D) Explain the self splicing process. **(07)**

Q.3 A) Discuss in detail about the formation of a peptide bond between the first two amino acids of a polypeptide chain by peptidyl transferase enzyme. **(08)**

Q.3 B) Explain protein sorting in detail. **(07)**

OR

Q.3 C) Elaborate the process of translocation during the process of translation. **(08)**

Q.3 D) Discuss in brief initiation of translation in eukaryotes. **(07)**

Q.4 A) Distinguish between lacO^c and lacI mutation. (08)

Q.4 B) Describe regulation of transcription of the Yeast Galactose utilization gene. (07)

OR

Q.4 C) Explain the molecular model for attenuation in trp operon. (08)

Q.4 D) Describe lac operon and their regulation in E.coli. (07)

Q.5 **Write short notes on any three of the following.** (15)

a. Eukaryotic ribosome
b. Role of elongation factors in eukaryotic translation
c. Production of mature mRNA
d. Lytic pathway
e. Catabolite repression

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D.B.J College Chiplun
ATKT Exam March 2024
Sem III
SYBSc (Bio Tech)
Sub: Bio Safety.

SYBT
11/3/24

Time – 2 1/2 hours Marks–75

Note: Attempt **all** questions.
All questions carry **equal** marks.
For **Q.2.Q.3** and **Q.4** attempt A and B **OR** C and D
Draw **neat labeled diagrams** wherever necessary.

Q.1 A) Do as directed. (Any fifteen) **(15)**

1. What is EPA?
2. Define GLP.
3. Write the significance of SOPs.
4. What is the raw data in study of GLP?
5. Give the examples of infectious agents included in Risk group 1.
6. The Workers are first line of defense for protecting themselves in lab.(State true or false)
7. Write the examples of safety equipment used in laboratory.
8. Enlist chemical agent used for decontamination of large surfaces.
9. ---------- is the most effective approach to managing biohazards
10. Give the role of quality manager.
11. Enlist types of training for lab workers and staff.
12. Write the two examples of secondary barriers.
13. Define validation.
14. Define primary barriers.
15. The formulation and packaging of injections must maintain---------and----------.
16. Give any two methods of sterilization of dressings and surgicals.
17 Extremes of pH prevent microbial attack. (State True or false).
18 Write any one bacteria that can contaminate contact lens solutions.
19 Define pyrogens.
20. Write the three steps of freeze drying.

Q.2 A) Explain potential hazards associated with work practice. **(08)**

Q.2 B) Describe the documentation of laboratory work. **(07)**

OR

Q.2 C) Give an account on audits and audit report for performing good laboratory practices. **(08)**

Q.2 D) Describe handling of cell cultures used in laboratory. **(07)**

Q.3	A)	Describe good diagnostic lab practice and procedures.	(08)
Q.3	B)	Explain training procedure given to lab workers and staff.	(07)
		OR	
Q.3	C)	Give an account on process of decontamination of hazardous material in laboratory.	(08)
Q.3	D)	Describe in detail occupational health.	(07)
Q.4	A)	Describe the factors determining the outcome of a medicament borne infection.	(08)
Q.4	B)	Elaborate on pharmaceutical ingredients susceptible to microbial attack.	(07)
		OR	
Q.4	C)	Define water activity and explain its effect on the shelf life of pharmaceutical product.	(08)
Q.4	D)	Explain the non injectable sterile fluids used in the hospital.	(07)
Q.5		**Write short notes on any three of the following.**	(15)
	a.	Biosafety level -4	
	b.	History of GLP	
	c.	Precautions to be taken while formulating injectables.	
	d.	Bioburden	
	e.	Animal facility	

Subject name - Cell Biology and Cytogenetics

Paper no. - IV

Time 2½ hrs.

SYBT
12/3/24

Note: Attempt **all** questions.
All questions carry **equal** marks.
Under**Q.2, Q.3 and Q.4** attempt A and B **OR** C and D

Q.1 A) Attempt any fifteen of the following (15)

1. Give the role of actin binding protein.
2. What is the role of microtubules in cilia and flagella?
3. Define myofibrils.
4. Give an example of microfilament.
5. Enlist examples of motor proteins.
6. Give any one property of microtubule.
7. What is MAPs?
8. Give the role of microvilli.
9. What is gap junction?
10. Give an example of ATP driven pump.
11. State the role of desmosomes.
12. What is cell adhesion?
13. Define symport.
14. Give one example of glycosaminoglycan.
15. Define bar bodies.
16. What is polyploidy?
17. Define paracentric inversion.
18. What is three point test cross?
19. Give the function of polytene chromosome?
20. What is trisomy 18?

Q.2 A) Describe assembly and disassembly of microfilament. **(08)**

Q.2 B) What is a cytoskeleton? Give an overview of its functions. **(07)**

OR

Q.2 C) Explain sliding filament model for muscle contractility. **(08)**

Q.2 D) Discuss the motor proteins associated with microtubules. **(07)**

Q.3 A) Explain cell coat with its functions. **(08)**

Q.3 B) Discuss Na^{+}-K^{+} pumpin detail. **(07)**

OR

Q.3 C) Describe any two transport process associated with uptake of nutrient by the prokaryotic cells. **(08)**

Q.3 D) Give an account on structural organization and functions of tight junction. **(07)**

Q.4 B) Explain gene mapping with two-point test cross. (08)

OR

Q.4 C) Discuss in brief Euchromatin and Heterochromatin chromosome. (08)

Q.4 D) Give the cytogenetic and general characteristics of Klinefelter and Turner syndrome. (07)

Q.5 **Write short notes on any three of the following.** (15)

a. Structure of intermediate filament.
b. Myosin
c. Cell adhesion
d. Trisomy 13
e. Pedigree analysis

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