JBD-8186

Seat No. _____

M. Sc. (Sem. III) Examination

May - 2022

CHNN-601(O) : Organic Chemistry

(New Course)

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 (a) Answer any two of the following : **14**

(i) Determine the structure of Anthocynidine.

(ii) Write a short note on Porphrins.

(iii) Discuss to chemistry of Hemin.

(b) Answer any one of the following : **4**

(i) What are flavones? How can flavanone be converted to flavones.

(ii) Short note on polyporic acid.

2 (a) Answer any two of the following : **14**

(i) Establish the structure of abietic acid.

(ii) Discuss the constitution of cadinene.

(iii) Detail on Squalene? Explain its synthesis from geranyl acetone.

(b) Answer any one of the following : **3**

(i) Describe position of the angular methyl group in abietic acid.

(ii) Define: Terpenes? How will you establish the position of double bonds in α -Endesmol.

3 (a) Answer any two of the following : 14

(i) Give the constitutional analysis of vitamin B_2.

(ii) Give detailed account on vitamin E.

(iii) Elucidate the structure of vitamin C and discuss its synthesis.

(b) Answer any one of the following : 4

(i) What are the diseases caused by vitamin deficiency? What can be done to prevent it.

(ii) Discuss classification and biological importance of vitamins.

4 (a) Answer any two of the following : 14

(i) Write an explanatory note on general biogenetic studies of alkaloids.

(ii) Give evidence on the structure of Reserpine and its synthesis.

(iii) Discuss of the Strychnine following :

(a) Nature of the N atoms

(b) Reduction and Oxidation

(b) Answer any one of the following : 3

(i) What is Hofmann's exhaustive methylation of alkaloids.

(ii) Strychnine oxidation with HNO_3, H_2SO_4, $K_2Cr_2O_7$.

J-8188 Seat No._____

M. Sc. (Sem. III) Examination

May – 2022

CHNN-601 (P) : Physical Chemistry

Time : **2.30** Hours] [Total Marks : **70**

1 Give the answer any **two** : **18**

(1) Explain the effect of light intensity on the rate of photochemical reaction.

(2) Derive the equation of rate law of the photochemical synthesis of HBr.

(3) Calculate the following when a photochemical reaction absorbed 30000 cal./mol (i) Einstein energy in Joule/ mole. (ii) Frequency of radiation, (iii) Wavelength in nm.

2 Give the answer any **two** : **17**

(1) Discuss: Langmuir absorption isotherm.

(2) Describe the mechanism of Heterogeneous catalytic reaction with the help of some examples.

(3) Explain: - Gibb's adsorption isotherm.

3 Give the answer any **two** : **18**

(1) Explain the determination of crystal structure by Debye-Scherrer methods.

(2) Discuss with figure and calculate the number of atoms in an unit cell (i) Simple cubic (ii) B.C.C. (iii) F.C.C.

(3) Write a short note: Schottky and Frenkel effect.

4 Give the answer any **two** : **17**

(1) Explain one component Sulphur system.

(2) Explain two component lead-silver system.

(3) Calculate the component of (i) KCI, NaCI and H_2O System (ii) KCl, NaBr and H_2O System.

JBD-8211

Seat No._____

M. Sc. (Sem. III) Examination

May – 2022

BOTCC-301 : Botany

(Plant Physiology) (New Syllabus)

Time : **2.30** Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory.
(2) Figures to the right side indicates marks of Sub questions.
(3) Illustrate your answers with net and labeled diagram if required.

SECTION - I

1 (a) Describe causes of seed dormancy. **14**

OR

(a) Write short note :
(1) Control of plant Senescence by Ethylene hormone. **7**
(2) Mechanism of Cell Death. **7**

(b) Answer the following questions in short : (any **four**) **4**
(1) Define 'turgor pressure'.
(2) Define 'Seed dormancy'
(3) What are seed need to germination.
(4) Give three groups of Exogenous dormancies.
(5) Give full name of 'PCD'
(6) Define `Respiration'

2 (a) Describe Main function of upwards water transport. 14

OR

(a) Write Short note :

(1) Water Deficit and Drought Resistance in Xerophytes. 7

(2) Phloem loading. 7

(b) Answer the following questions in short : (any **Three**) 3

(1) Potassium and Phosphorus are micronutrient - true or false.

(2) The mechanism of phloem loading in such case has been called as _____ mechanism.

(3) The sugars are now transported to cells in sink by a short distance pathway which has also been called as _____ transport?

(4) Define 'Active Transport'.

(5) Transport of two solutes in opposite directions is _____.

SECTION-II

3 (a) Describe Calvin cycle. 14

OR

(a) Write short note :

(1) Photosynthetic Pigment systems. 7

(2) CAM pathway. 7

(b) Answer the following questions in short : (any **Four**) 4

(1) In plants like sugarcane, maize, etc., the type of photosynthesis is _____.

(2) The first stable product of CO_2 fixation is?

(3) In the dark reaction of photosynthesis CO_2 is accepted by which molecule.

(4) The seat of light reaction of photosynthesis is in _____.

(5) The photophosphorylation is also known as the formation of _____.

(6) Which pigment is responsible for making the plant sensitive to light effect?

4 (a) Describe Physlological effects of action of Gibberellins. **14**

OR

(a) Write short note :

(1) Types of photoperlodism. **7**

(2) Vernalization. **7**

(b) Answer the following questions in short : (any **Three**) **3**

(1) Promote bolting in cabbages and beet by which hormone.

(2) Growth curve is mostly _____.

(3) Which hormone is used to keep flowers fresh for a longer time?

(4) Which is the most well-studied and important natural auxin?

(5) Which is the flowering hormone which is synthesized in leaves?

J-8285 Seat No. _____

M. Sc. (Sem. III) Examination

May – 2022

Biotechnology : BT-CC-301

(rDNA technology & Genetic Engineeering)

Time : **2.30** Hours] [Total Marks : **70**

SECTION - I

1 (a) Multiple choice based questions (one mark each) : **3**

(1) The mechanism of intake of DNA fragments from the surrounding medium by a cell is called
- (a) transformation
- (b) transduction
- (c) Both (a) and (b)
- (d) Conjugation

(2) Gene cloning refers to the
- (a) production of large number of copies of the gene being cloned
- (b) production of asexual progeny from a single individual or a cell
- (c) both (a) and (b)
- (d) none of these

(3) In gel electrophoresis, DNA molecules migrate from _____ to _____ ends of the gel.
- (a) negative ... positive
- (b) basic ... acidic
- (c) long ... short
- (d) positive to negative

(4) A plasmid
- (a) is a circular DNA molecule
- (b) always contains an origin of replication
- (c) usually contains one or more restriction sites
- (d) all of the above

(b) Short answer (three marks each) : 6

(1) Write a note on DNA structure and its properties.

(2) Explain the role of restriction enzymes in genetic engineering.

OR

(b) Short answer (three marks each) 6

(1) Name different enzymes used in DNA amplification.

(2) What are adaptor genes.

(c) Medium sized answer (Four marks each) 8

(1) What are vectors and write a note on their characteristics.

(2) Give a brief account on naturally occurring plasmids.

OR

(c) Medium sized answer (Four marks each) : 8

(1) Write a note on ori marker genes.

(2) Enlist different types of pBR.

2 (a) Very short answer questions (one mark each) : 2

(1) Enlist different types of promoter.

(2) Define Linkers.

(3) Role of Alkaline phosphatase.

(b) Short answer (three marks each) : 6

(1) Construct pBR322 and enlist its various characteristics.

(2) Write a note on expression vectors.

OR

(b) Short answer (three marks each) : 6

(1) Construct pBR325and enlist its various characteristics.

(2) Give brief account on pUC 18 and pUC 19.

(c) Short note type (five marks each) : 10

(1) Explain in detail Methylation dependent restriction enzymes and their applications.

(2) Write a note on cloning methodology.

OR

(c) Short note type (five marks each) : 10

(1) Explain restriction modification types and their characteristics.

(2) Give detail accounts for screening and cloning of recombinants.

SECTION - II

1 (a) Multiple choice based questions (one mark each): 3

(1) The gene formed by the joining of DNA segments from two different sources are called as

(a) recombinant gene (b) joined gene

(c) both (a) and (b) (d) chimaeric gene

(2) Which of the following enzyme is used to cut DNA molecule in rDNA technology?

(a) ligase

(b) phosphatase

(c) ribonuclease

(d) restriction enzymes

(3) Restriction enzymes are also called as

(a) bioiogical scissors

(b) molecular scalpels

(c) molecular knives

(d) all of these

(4) The plasmid used by Cohen and Boyer for their transformation experiment was

(a) pSC 101 (b) PUC 17

(c) pBR 322 (d) E.coli plasmids

(b) Short answer (three marks each) : 6

(1) Write down sangers method in brief.

(2) Write a note pyrosequencing method.

OR

(b) Short answer (three marks each) : 6

(1) Advanced method in DNA sequencing.

(2) Write a note chemical method.

(c) Medium sized answer (Four marks each) : 8

(1) Explain in detail transfection technique.

(2) Enlist in different methods for introduction of DNA into mammalian cells.

OR

(c) Medium sized answer (Four marks each) 8

(1) Give brief account on Gene silencing technique.

(2) Write a note on gene knockout therapy.

2 (a) Very short answer questions (one mark each) : 2

(1) Enlist different types of PCR.

(2) What are marker genes?

(3) Write a note on T_4 DNA polyrnerase.

(b) Short answer (three marks each) : 6

(1) What is a blotting technique.

(2) Explain any one PCR working.

OR

(b) Short answer (three marks each) : 6

(1) Methods for primer design.

(2) Different gene expression and protein array.

(c) Short note type (five marks each) : 10

(1) Role of PCR in bacterial and viral detection. Its applications.

(2) Explain the working and function of Real time PCR.

OR

(c) Short note type (five marks each) : 10

(1) Explain Allele specific amplification.

(2) Role of PCR in molecular diagnosis.

JBD-8253

JBD-8253 Seat No._____

M. Sc. (Sem. III) Examination

May / June - 2022

Mathematics : Paper - MSM-1301

(Functional Analysis - I) (New Course)

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 Attempt any **two** of the following :

(a) If Y is a branch space then prove that $B(X,Y)$ is banach space, where $B(X,Y)$ is a space of all bounded linear operators.

(b) If $1 < p < \infty$, then prove that space l_p^n is a Banach space.

(c) If $T \in \beta(N, N')$, where N, N' are the normed linear spaces, and $M = \ker(t)$, show that T induces a natural linear transformation T' of $\frac{N}{M}$ into N' and $\|T\| = \|T'\|$.

(d) Let N and N' be a norm space and $T: N \to N'$ be a linear map. Then prove that the following conditions are equivalent

(1) $\|T(x)\| \leq \alpha \|x\|$ for all $x \in N$ and some $\alpha > 0$.

(2) T is continuous at 0

(3) T is continuous on N

(4) If $S = \{x \in N : \|x\| \leq 1\}$ then $T(S)$ is bounded set in N'.

2 Attempt any **three** of the following:

(a) Let M be a linear subspace of a normed linear space N, and let f be a functional on M. If $x_0 \notin M$, and if $d = d(x_0, M) \equiv \inf\{\|x_0 - x\| : x \in M\}$, prove that there exists a functional f_0 defined on N^* such that $f_0(M) = \{0\}$, $f_0(x_0) = 1$, and $\|f_0\| = \frac{1}{d}$.

(b) Let M be a closed linear subspace of a normed linear space N, and let f be a functional on M. If $x_0 \notin M$, and if $M_0 = M + [x_0]$, prove that f can be extended to a functional f_0 defined on M_0 such that $\|f\| = \|f_0\|$.

(c) State and prove Hahn-Banach theorem for normed space.

(d) Prove that $\left(L_p\right)^* = L_q$, where $1 < p, q < \infty$ with $\frac{1}{p} + \frac{1}{q} = 1$.

(e) Prove that $\left(l_p\right)^* = l_q$, where $1 < p, q < \infty$ with $\frac{1}{p} + \frac{1}{q} = 1$.

3 (a) If T is a continuous linear transformation from a Banach space B onto a Banach space B' and S_r is the open sphere centered at origin of radius $r > 0$ in B, prove that there exists $\delta > 0\ S'_\delta \subset T\left(S_r\right)$, where S'_δ is the open sphere centered at origin of radius $\delta > 0$ in B'.

OR

(a) If P is a projection on a Banach space B, and M, N are its range and null space, then show that M, N are closed linear subspaces of B such that $B = M \oplus N$.

(b) State and prove the closed graph theorem.

OR

(b) Prove that a nonempty subset X of a normed linear space N is bounded if and only if $f(X)$ is a bounded set of numers for each $f \in N^*$.

(c) Prove the existence of the conjugate operator T^* for $T \in \beta(N)$, where N is a normed linear space. And, prove its properties about the norm.

4 (a) Give an example of a Banach space that is not a Hilbert space.

OR

(a) Let $\{u_1, u_2, \ldots\}$ be a countable orthonormal set in a Hilbert space X and $x \in X$. Then prove that $\Sigma_n |\langle x, u_n \rangle|^2 \leq \|x\|^2$ where equality holds if and only if $x = \Sigma_n |\langle x, u_n \rangle| u_n$.

(b) State and prove Riesz representation theorem.

OR

(b) State and prove projection theorem.

JBD-8252

Seat No._____

M. Sc. (Sem. III) Examination

May - 2022

Mathematics : MSM - 1302

(Complex Analysis) (New Course)

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory.

(2) Standard notations and conventions are followed.

1 (a) State and prove Cauchy-Riemann conditions for function has derivative. **6**

(b) Check the analyticity of the following function at origin **6**

$$f(z)=\begin{cases}\frac{1}{z^3}; z\neq 0\\ 0; z=0\end{cases}$$

(c) Let $f_1(z)$ and $f_2(z)$ be two entire function **6**

c_1 and c_2 be any complex numbers. Does $c_1 f_1(z)+c_2 f_2(z)$ entire function? Why?

OR

(a) Let $f(z)$ be an anlytic function throughout a domain D and $f(z)=0$ at each point z in D or line segment contained in D. then prove that $f(z)$ is identically equal to zero throughout D. 6

(b) Show that $u(x,y)=e^{x^2-y^2}\cos(2xy)$ is harmonic everywhere and find a harmonic conjugate for $u(x,y)$. 6

(c) Does the Cauchy-Riemann condition is sufficient for function to be analytic? Why? 6

2 Attempt any **three** of the following: 17

(a) State and prove Cauchy Integral Theorem for multiply connected domain.

(b) State and prove Morera's Theorem.

(c) Evaluate $\int_C img(z^2)dz$ where C is the bondary of the square with vertices $0, i, 1+i, 1$ in the clockwise direction.

(d) Show that $\overline{\exp(iz)}=\exp(i\bar{z})$ if and only if $z=n\pi, n\in\mathbb{Z}$.

(e) Find all the possible value of $\left(-1+\sqrt{3}i\right)^{3/2}$.

3 (a) State and prove fundamental theorem of algebra. **6**

OR

(a) State and prove Laurent's Theorem. **6**

(b) Find Maclaurin's series of $f(z) = e^z \cosh z$. **6**

OR

(b) Evaluate $\int_C \frac{dz}{z(z+2)^3}$ where $C: |z| = 5$ using Cauchy Integral Formula. **6**

(c) Show that if a function f is analytic and not constant in a given domain D, then $|f(z)|$ has no maximum value in D. **6**

OR

(c) Let $f(z) = u(x, y) + iv(x, y)$ be an entire function. If $u(x, y) \leq u_0$ for some u_0 and all x, y, then show that $u(x, y)$ must be constant throughout. **6**

4 (a) Let f be analytic funct at z_0. Show that z_0 is a zero of order m if and only if there exist an function g which is analytic and nonzero at z_0 such that $f(z) = (z - z_0)^m g(z)$. **6**

OR

(a) State and prove Cauchy Residue Theorem. **6**

(b) Attempt any **two** of the following: **11**

(1) Using Cauchy residue theorem evaluate the following integral along $|z|=1$.

$$\oint \frac{(2z-1)dz}{z(z+2)(2z+1)}$$

(2) Evaluate $\int_0^{2\pi} \frac{d\theta}{(2+\cos\theta)^2}$.

(3) Evaluate $\int_{-\infty}^{\infty} \frac{dx}{(x+1)(x^2+2)}$.

JBD-8238 Seat No. _____

M. Sc. (Sem. III) Examination

May – 2022

Physics : MSPHY 301CC

(Nuclear Physics - 1 Instruments)

(New Course)

Time : **2.30** Hours] [Total Marks : **70**

Instruction: (1) Symbols have their usual meanings.
(2) Figure indicated on right hand side individual marks.

1 (a) Answer the following : (Any **One**) **8**
(1) Give a brief description of hyperfine structure of atomic spectra.
(2) Describe the ground state of the deuteron atom.

(b) Answer the following : (Any **Two**) **8**
(1) What is nuclear spin? discuss its importance.
(2) Explain electric moment of the Deuteron.
(3) Discuss the excited state of the Deuteron.

(c) Answer the following : (Any **One**) **2**
(1) Write formula of Differential cross section for elastically scattered particles for all value of *l*.
(2) Give significance of the sign of the Scattering length.

2 (a) Answer the following : (Any **One**) **7**
(1) Discuss in brief Nuclear reaction and cross sections.
(2) Explain Breit-Wigner dispersion formula for all values of *l*.

(b) Answer the following : (Any **Two**) **8**

(1) Describe compound Nucleus.

(2) Explain semi classical description of stripping reaction.

(3) Explain wave mechanical description of stripping reaction.

(c) Answer the following : (Any **One**) **2**

(1) Obtain the cross section for the formation of the compound nucleus by s- wave neutrons.

(2) Write elastic scattering and capture process reactions for beam of neutrons incident on a Pb^{208}.

3 (a) Answer the following : (Any **One**) **8**

(1) Describe scientific Principal and Working of Scanning Electron Microscope.

(2) Explain construction and working of TEM Transmission Electron Microscope.

(b) Answer the following : (Any **Two**) **8**

(1) Discuss advantage over conventional SEM.

(2) Explain TEM image mode and specimen preparation.

(3) Discuss Scanning Force Microscopy.

(c) Answer the following : (Any **One**) **2**

(1) What is Magnetic lens?

(2) Compare STM with SFM.

4 (a) Answer the following : (Any **One**) **7**

(1) Explain UV-V is single beam instrument function with figure, campier single beam with double beam.

(2) Discuss various types of molecular bonding by using UV-V Spectroscopy.

(b) Answer the following : (Any **Two**) **8**

(1) Explain principle of UV-V Spectroscopy.

(2) Describe Beer-Lambert Law.

(3) Give brief about Applications of UV Spectroscopy.

(c) Answer the following : (Any **One**) **2**

(1) Write name of regions of electromagnetic Spectrum in wavelength orders.

(2) Write Visible Spectral colors seen by eye and respective wavelength.

JBD-8275 Seat No. _____

M. Sc. (Electronics) (Sem. III) Examination

May - 2022

MSELE301CC : Computer-2 & Instruments

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 (a) Attempt any **one** : **8**

(1) (a) Explain Mathematical Function of Excel

(b) Explain if function in MS Excel

(2) What is search and replace? Write down step for it.

(b) Attempt any **two** : **8**

(1) Explain Graph in M.S. Excel. Write down steps to draw graph for below given voltage and current.

Voltage (Volts)	Current (mA)
1 V	10 mA
2 V	20 mA
3 V	30 mA
4 V	40 mA
5 V	50 mA

(2) Explain count function in MS Excel.

(3) Explain Logical Function in MS Excel

(c) Attempt any one : **2**

(1) What is Function in MS Excel?

(2) What is Alignment Tab in MS Excel?

2 (a) Attempt any **one** question : 7

(i) What is network? Explain LAN, WAN and MAN.

(ii) Explain network topology in detail.

(b) Attempt any **two** questions : 8

(1) Explain URL in brief.

(2) Explain applications of internet in short.

(3) Discuss web surfing.

(c) Attempt any **one** : 2

(1) What are search engines?

(2) What is domain name in the network?

3 (a) Attempt any **one** : 8

(1) Describe Scanning Tunneling Microscopy.

(2) Describe Scanning Force Microscopy.

(b) Attempt any **two** questions : 8

(1) State Advantages and disadvantages of SEM.

(2) Explain principle and working of TEM.

(3) Explain sample requirements in the different microscopy.

(c) Attempt any **one** : 2

(1) What is Microscopy?

(2) What is resolution in TEM?

4 (a) Attempt any **one** : 7

(1) Discuss Instrumental components of UV-Visible spectrometer.

(2) Discuss the Comparison between Single Beam and Double Beam Spectrometer Systems.

(b) Attempt any **two** : 8

(1) Write the applications of UV-Visible spectroscopy.

(2) Briefly explain Principle of UV-Visible spectroscopy.

(3) Derive the Beer-Lambert's law. Mention the limitation of Beer-Lambert's law.

(c) Attempt any **one** : 2

(1) Mention the radiation sources in UV-Visible spectroscopy.

(2) What is the wavelength range for UV spectrum of light?

JBD-8279

Seat No._____

M. Sc. (Sem. III) Examination

June - 2022

MSELE301ES : Electronics

(Research Methodology)

Time : **2** Hours] [Total Marks : **35**

Instructions : (1) Draw neat diagram whenever necessary.

(2) Symbol has their usual meaning.

(3) Figures to the right indicate full marks of sub questions.

1 (a) Answer any **two** : **8**

(1) What is research ? Write a note on basic and applied research.

(2) Discuss Literature citation.

(3) Describe the essential steps in Research.

(b) Answer any **one** : **4**

(1) Write full form of ISBN.

(2) What is reference card ?

2 (a) Answer any **one** : **8**

(1) Describe the different components of research report.

(2) What are the formatting and computing systems of thesis ?

(b) Answer any **one** : 4

(1) What are the abbreviations and symbols?

(2) Why appendices are important in thesis?

3 Answer any **eleven** : 11

(1) What does Research stand for ?

(2) Which type of research is observation data ?

(A) Quantitative research

(B) Qualitative Research

(C) Descriptive research

(D) Fundamental research

(3) Research creates new knowledge that is generally _____

(A) Applicable (B) Not applicable

(C) Scientific (D) None of these

(4) Group interview is _____ field research type technique.

(A) Library research

(B) Field research

(C) Laboratory research

(D) Fundamental research

(5) Scientific method consists of systematic _____

(A) Observation, classification and interpretation of data.

(B) Small group study of random behaviour

(C) Personal interview

(D) Case study

(6) The scientific study of research practices is known as _____

(A) Para-research (B) Meta-research

(C) Octa-research (D) Hexa-research

(7) Which is one of the methodologies a way to systematically solve the research problem ?

(8) Audio-visual recording devices techniques are in _____ research.

(A) Library (B) Laboratory

(C) Field (D) None of these

(9) _____ is the simulation quantitative approach research.

(A) Mass observation (B) Roll model

(C) Electric model (D) Building model

(10) _____ is the pursuit of truth as determined by logical considerations.

(A) Scientific Method (B) Arts Method

(C) Commerce Method (D) B.Ed. Method

(11) _____ has become an important tool for finding published literature.

(A) Mail (B) Google

(C) gmail (D) Scientist

(12) Participant observation is _____ field research type technique.

(A) Fundamental research

(B) Library research

(C) Laboratory research

(D) Field research

(13) What is the full form for ISSN ?

JBD-8276 Seat No. _____

M. Sc. (Electronics) (Sem. III) Examination

June - 2022

MSELE302CC : Microprocessor Peripherals & Advance Microprocessors

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) Figures on R.H.S. indicate individual marks.

(2) The symbols have their usual meanings.

1 Answer any **two** : **18**

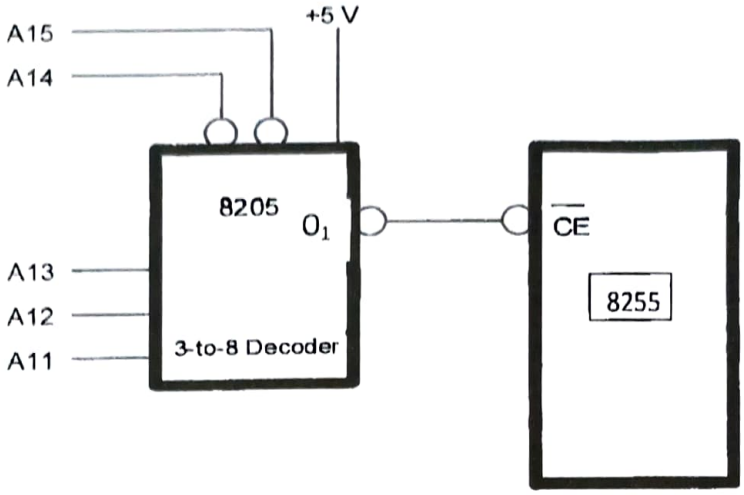
(a) Draw logic block diagram of 8279 and explain it.

(b) Draw the internal expanded block diagram of 8155 and explain it.

(c) Explain MPU and Keyboard interfacing using Programmable interfacing device.

2 (a) Draw and explain block diagram of 8255 (Programmable Peripheral Interface) in detail. **9**

(b) Determine the addresses of the control and I/O ports in below given figure. 8



OR

(a) Explain control word of 8255 (Programmable Peripheral Interface) in detail. 9

(b) Write a BSR control word subroutine to set bits PC_7 and PC_3 and reset them after 10 ms. In case of Programmable Peripheral Interface 8255.
Consider address of Port-A as 80H. Use instruction CALL DELAY for delay. 8

3 Answer any **two** : 18

(a) Draw and explain block diagram of Programmable Interval Timer (PIT) 8254.

(b) Explain any two modes of PIT 8254.

(c) Write note on ADC.

4 (a) Explain internal architecture of 8086. 10

(b) Write differences between 8085 and 8086. 7

OR

(a) Write note on Temperature controller using any microprocessor. 9

(b) Write note on water level controller. 8

JBD-8277 Seat No. _____

M. Sc. (Electronics) (Sem. III) Examination

June - 2022

MSELE303CC : Communication - II

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) Attempt all questions and make suitable assumptions wherever necessary.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if necessary.

1 Attempt any **three** : **18**

(a) Define and explain :
(1) Gain of antenna
(2) Beam width
(3) Major lobe of Radiation pattern

(b) Design 6 element Yagi-Uda antenna for 300 MHz frequency.

(c) Explain Linear array of 'n' isotropic sources of equal amplitudes and spacing with necessary detail.

(d) Explain rectangular horn with necessary detail.

2 (a) RADAR is designed for operation at 6 GHz with an antenna of diameter 5 m. Calculate the peak pulse power required to have a maximum range of 500 km with a target cross-section area 9 m^2. **6**

(b) Define Analog Fax Transmission and Digital Fax transmission. List the difference between Analog Fax Transmission and Digital Fax transmission. 6

(c) Explain CDMA with necessary details. 5

OR

2 (a) Describe FMCW Radar with necessary detail. 6

(b) Describe Cylindrical scanning with necessary detail. 6

(c) Explain TDMA with necessary details. 5

3 Attempt any **three** : 18

(a) Explain Automatic tracking radar (ATR) with necessary details.

(b) Define Maximum usable frequency. Describe Maximum usable frequency in detail.

(c) Explain principal image transmission with necessary detail.

(d) Explain FDMA with necessary details.

4 (a) Describe propagation of sky with necessary detail. 6

(b) Explain pulse radar with help of block diagram. 6

(c) Explain Color TV receiver with necessary details. 5

OR

4 (a) Describe propagation of radio waves of different frequency in detail. 6

(b) Derive RADAR range equation list the Factor which effect the radar range. 6

(c) Explain Color TV camera with necessary detail. 5
