



Name: Roll No.:

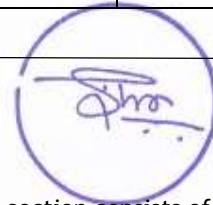
Branch: Signature of Invigilator:

Semester: VIth Date: 26/04/2022 (MORNING)

Subject with Code: CL313 POLYMER TECHNOLOGY - II

Marks Obtained	Section A (30)	Section B (20)	Total Marks (50)

INSTRUCTION TO CANDIDATE



1. The booklet (question paper cum answer sheet) consists of two sections. First section consists of MCQs of 30 marks. Candidates may mark the correct answer in the space provided / may also write answers in the answer sheet provided. The Second section of question paper consists of subjective questions of 20 marks. The candidates may write the answers for these questions in the answer sheets provided with the question booklet.
2. The booklet will be distributed to the candidates before 05 minutes of the examination. Candidates should write their roll no. in each page of the booklet.
3. Place the Student ID card, Registration Slip and No Dues Clearance (if applicable) on your desk. All the entries on the cover page must be filled at the specified space.
4. Carrying or using of mobile phone / any electronic gadgets (except regular scientific calculator)/chits are strictly prohibited inside the examination hall as it comes under the category of unfair means.
5. No candidate should be allowed to enter the examination hall later than 10 minutes after the commencement of examination. Candidates are not allowed to go out of the examination hall/room during the first 30 minutes and last 10 minutes of the examination.
6. Write on both side of the leaf and use pens with same ink.
7. The medium of examination is English. Answer book written in language other than English is liable to be rejected.
8. All attached sheets such as graph papers, drawing sheets etc. should be properly folded to the size of the answer book and tagged with the answer book by the candidate at least 05 minutes before the end of examination.
9. The door of examination hall will be closed 10 minutes before the end of examination. Do not leave the examination hall until the invigilators instruct you to do so.
10. Always maintain the highest level of integrity. Remember you are a BITian.
11. Candidates need to submit the question paper cum answer sheets before leaving the examination hall.

Birla Institute of Technology, Mesra
Ranchi-835215

CL313 Polymer Technology II

Session: SP22

SEMESTER: VI

Full Marks: 50

All questions are to be attempted.

Section A: Choose the most appropriate option and mark (✓) or fill in the blanks with the correct option (whichever is applicable). There is no negative marking.

Marks: 30

Sl. No.	Question	Marks
1	Composites can be classified based on_____ (a) Matrix type (b) Reinforcement Constituent (c) Matrix type and Reinforcement Constituent (d) Neither Matrix nor Reinforcement	1
2	Which of the following is not an advantage of composites? (a) Easy to manufacture and durable (b) Heavy-weight and non-versatile (c) Excellent thermal, mechanical, and chemical properties (d) Economical and tailor made	1
3	Hand lay-up method can be easily used for manufacturing_____ (a) automotive parts (b) dashboard (c) boat hulls (d) All of the mentioned	1
4	What is the primary purpose of Vacuum Bagging in autoclave processing? (a) It helps in removing the air from the interfaces (b) It helps to make the size smaller (c) In autoclave processing Vacuum Bagging is not used (d) None of the mentioned	1
5	Lay-up process is used where_____ (a) low production volume and low performance is required (b) low production volume and high performance is required (c) high production volume and high performance is required (d) high production volume and low performance is required	1
6	Manufacturing of components having continuous lengths and the constant cross-sectional shape is done by_____ process. (a) roving (b) pultrusion (c) curing (d) pulling	1
7	Filament winding is_____ (a) used to produce cylindrical surfaces only (b) used to produce curvature surfaces only (c) a process in which resin-impregnated fibers are wound over a rotating mandrel at the desired angle (d) none of the mentioned	1
8	Polyacetal is superior to Nylon in respect of fatigue resistance though these are comparable in crystallinity because of a) H-bonding b) C-O bond c) lesser water absorption.	1

9	_____ polymer has been used for numerous optic and optoelectronic products. (a) Polyether ether ketone (b) Polybenzimidazole (c) Liquid crystal polymers (d) Polyetherimide	1
10	_____ are prepared from an aromatic tetraamine and an aromatic dicarboxylic acid or a derivative of it. a) Polyether ether ketone (b) Polyetherimide (c) Polybenzimidazole (d) None of the mentioned	1
11	The long axes of the (rod-like) molecules are either perpendicular to the plane in LCPs are called as: (a) smectic A (b) smectic C (c) Nematic A (d) Nematic C	1
12	_____ is produced by reaction of sodium sulphide and dichlorobenzene in a polar solvent such as N-methylpyrrolidone and at higher temperature. a) Polyether ether ketone (b) Polyphenylene sulfide (c) Polybenzimidazole (d) None of the mentioned	1
13	What made the use of plastics in packaging? (a) Durability (b) Light weight (c) Design freedom (d) All of the mentioned	1
14	_____ plastics are used for the manufacturing of fuse boxes, switches and knobs. (a) PPS (b) Urea formaldehyde (c) Polystyrene (d) PVC	1
15	_____ plastics are used for the manufacturing of telephone handsets, computer housings and keyboards. (a) ABS (b) Nylon (c) Polyethylene (d) Polycarbonate	1
16	If the resinification reaction between formaldehyde and phenol is stopped at early stages, a low molecular weight product A, having 3-4 aromatic rings and 3-5 methylol groups, which is soluble in alkalis and alcohol is formed. What is the name of the product A? a) resol b) resitol c) resite d) novolac	1
17	Which of the following phenolic resins are suitable for the decorative laminates? a) caustic soda catalyzed resols b) ammonia catalyzed resols c) spirit resols d) resites	1
18	Why is a stainless steel kettle used in the production of casting grade phenolics? a) to minimize corrosion b) to minimize color formation	1

	c) to maximize color formation d) to increase strength	
19	Which solvent can be used to dissolve epoxy moulded product? a)Methanol b) Conc.H ₂ SO ₄ c) Acetone d)None	1
20	Epoxy resin is a) formed by addition polymerization b) cured at room temperature by polyamines c) encapped with epoxy groups at chain ends	1
21	Polyurethane is not used for a) Mattresses & foam B. Coating material C. Adhesives D. Bottles as it is cured at room temperature.	1
22	Which of the thermoplastic is not opaque? a)Polyphenylene sulphide b)polycarbonate c) polyetherether ketone	1
23	'Noryl' is trade name of _____ blends.	1
24	When a crystalline polymer is mixed with an amorphous polymer we get a)Mechanical blend b)Solution blend c)Latex blend d)Reactive blend	1
Answer the following :		
25	List out four similarities and dissimilarities between PE and Polyformaldehyde in respect of their chemical structure and properties.	2
26	What is the specific reason behind two glass transition points for PPO and PC?	2
27	Why does PPO show lesser shrinkage than nylon?	2

Section B

Marks:20

1. Two polymers ,PPO and PS, are melt blended in following weight ratios:

Sample1	80:20
Sample2	75:35
Sample3	50:50

Find out the glass transition points of these blends using Gordon Taylor equation.

3

- What structural attributes are to be considered to support outstanding oxidative stability and resistance to ozone in case of polycarbonates? 2
- Distinguish the terms compatibility and immiscibility in terms of specific polymer blends. 2
- Give reaction mechanism of Urea formaldehyde resin formation , mention reaction temperature and stoichiometric ratio of reactant. 3
- Write short notes on the following manufacturing techniques of polymer composites with a neat sketch: Filament winding , Centrifugal Casting 2.5x2=5
- Write short notes on Plastics in Home appliances, Packaging Applications 2.5x2=5

Date of Examination: 26.04.2022